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CHARLES ELMORE

Supreme Court of the United States.

OCTOBER TERM, 1930.

No. 54.

CARBICE CORPORATION OF AMERICA,
Petitioner,

vs.

AMERICAN PATENTS DEVELOPMENT CORPORATION AND DRY ICE CORPORATION OF AMERICA,
Respondents.

BRIEF FOR RESPONDENTS.

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December, 1930.

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CARBICE CORPORATION OF AMERICA,
Petitioner-Defendant,

vs.

AMERICAN PATENTS DEVELOPMENT CORPORATION and DRY ICE CORPORATION OF AMERICA,
Respondents-Plaintiffs.

BRIEF FOR RESPONDENTS.

This equity suit, brought by the Respondents on patent No. 1,595,426 (p. 187), is before this Court on a writ of *certiorari* to the Circuit Court of Appeals for the Second Circuit.

In the District Court, the patent was held not to be infringed (p. 429; 25 F. (2nd) 730), so the matter of validity was not there decided. The Circuit Court of Appeals held the patent (claims 2, 3, 4 and 6 being in issue) valid and infringed (pp. 441-453; 38 F. (2nd) 62).

This is the only suit in which this patent has been involved.

A statement of the case, supplementary to that in the Petitioner's brief, is necessary for correcting inaccuracy or omissions in the Petitioner's statement.

Supplementary Statement of the Case.

The patent (p. 187) is for a "refrigerating apparatus" in which three simple elements are combined in new cooperative relationship to constitute a unique physical assembly that yields strikingly novel and valuable results. Chief among the elements of the combination is the primary and dynamic element, solid carbon dioxide—although old and theretofore commercially useless—which originates the forces that animate the other and relatively subordinate elements and cause them responsively to conjoin their functions and thereby to make it possible for a single pound of solid carbon dioxide to do the refrigerating work of from 15 to 20 pounds of water ice whereas it had always been known to have a refrigerating value of twice—and only twice—that of water ice.

It does not appear that even a pound of solid carbon dioxide was sold during the many years it was known prior to the patent in suit: the Respondents within about two years after starting operations under the patent sold about 5,000,000 pounds of it. The Circuit Court of Appeals said (38 F. (2nd) *63)

> "Counsel assert and we think justly that plaintiffs have created a new industry."

In the creation of that new industry the teachings of the patent in suit played a controlling part.

The Respondents are making no claim to a monopoly in solid carbon dioxide. Their patentee discovered, and patented, one way to use it with multiplied efficiency previously thought impossible. Respondents object to Petitioner's deliberate complicity in the unauthorized use of it *in that way*, thereby willfully contributing to the infringement of that patent.

Solid carbon dioxide:

It has been known for nearly a century that carbon dioxide (CO_2) may exist in any one of three forms, namely, a gas, a liquid and a solid. In all of these forms it is colorless and odorless.

The gas is readily reduced by cold and pressure to the liquid form, known as carbonic acid. By rapid evaporation of the liquid, it may be converted into a snow-like solid which is intensely cold—very much colder than water ice; it has a temperature of about 110° below zero, Fahrenheit.

The solid, in passing back to the gaseous state, does so without becoming liquid; that is, on "melting", it changes directly into the gas which, also, is extremely cold, about 110° below zero. The volume of the gas thus given off is about 500 times that of the solid (p. 142, fol. 205).

All of the foregoing has been known for many, many years, as is shown by the Petitioner's numerous exhibits which also set forth methods of producing the solid carbon dioxide. The patent in suit asserts no novelty in solid carbon dioxide, nor in methods of producing it, nor in the knowledge that it is very cold, etc.

Solid carbon dioxide, because of its known extremely low temperature, naturally suggested itself for use as a refrigerant, and its refrigerating value, as compared with water ice, was determined.

Experiment showed that it required twice as many heat units to change solid carbon dioxide from its solid form as it did thus to change water ice; so the refrigerating value of the solid carbon dioxide was, and was recognized as being, twice that of water ice (p. 143, fol. 206; p. 145, fol. 209; p. 82, fol. 123; p. 87, fol. 130).

But the cost of solid carbon dioxide was and is ten times greater than that of water ice (p. 214).

So the use of solid carbon dioxide for commercial refrigeration was economically impossible.

Prior proposals as to uses of solid carbon dioxide:

It was proposed for use, and may have been used on a small scale, for dermatological purposes, such as for external applications in lesions and skin diseases (p. 514 following p. 428; and p. 118), and in connection with the calibration of thermometers (p. 138).

Petitioner's witness Starr says (pp. 44-45) that, in 1900, at the request of a St. Louis doctor, he made a small amount of solid carbon dioxide for freezing some human and animal tissues for microscopic slides; but this experiment was performed only once, as it was found cheaper and just as satisfactory to use ammonia (p. 47). And Goosmann made some small pencils of the solid for use in freezing specimens for microscopic slides (p. 119).

The solid carbon dioxide remained, largely, a subject for interesting class room demonstrations, as Churchill used it in lecturing to a freshman class in elementary chemistry; he froze mercury and eggs, and froze water in a red hot crucible (pp. 57-58). And, abroad, Churchill used it to produce low temperatures in vessels in which he was carrying on certain organic reactions, and to accelerate the crystallization of certain liquids (p. 60).

There were a few suggestions of other uses for solid carbon dioxide that are of more or less academic interest; nothing came of them. Elworthy, for example, in his U. S. patent 579,866 and British patent 7436, suggested that pieces of the solid be used to aerate and cool water by merely dropping a piece in the water (pp. 386-387), much the same idea being proposed by Cremieu in his patent 1,421,176 (p. 419). Petitioner's witness, Goosmann, states that solid CO_2 is ineffective for this purpose (p. 122, fol. 178). And Heyl, in his French patent 344,957 (p. 391) proposed a mechanical method for keeping solid CO_2 frozen in order that it might be shipped economically, the heavy steel cylinders required for the liquid CO_2 being rendered unnecessary. Heyl makes no suggestion as to refrigerating foodstuffs.

Elworthy, in his patents above referred to, says that the solid carbon dioxide may be made "available for nearly all purposes for which ice is now used" (p. 386). *And this is of real importance, for it is illustrative of the fact* that the very few suggestions contained in the prior art for the use of solid carbon dioxide as a refrigerant, involved a mere *substitution* of one cooling medium (solid carbon dioxide) for another (water ice) in the belief that the one would function just as the other had done, in the same way, and for the same reasons, in the same environment and relationships (Petitioner's witness Starr, pp. 51-52, fols. 79, 80). The prior art never progressed beyond this simple idea of *substitution*, never conceived the now evident necessity for a total reorganization of the refrigerating methods, apparatus, and relationships as a prerequisite to the economical use of solid carbon dioxide.

The prior art could never find a way to increase the efficiency of solid carbon dioxide to offset its greater cost and make it available for commercial refrigerating purposes (Petitioner's witnesses Starr, p. 87, fols. 130-131; Goosmann, p. 210).

In spite of all the knowledge that existed as to carbon dioxide, it does not appear that any of the solid was ever sold or entered into commercial channels in any way.

The patent in suit:

Then came the invention here in issue, under which the Respondents began commercial operation in the spring of 1925 (p. 18). In that year they sold 366,000 pounds of solid carbon dioxide and, up to the end of 1927, they had sold nearly 5,000,000 pounds of it. Of this amount about 90% has been used as set forth in the patent in suit (pp. 19, 157). To the solid carbon dioxide the Respondents gave the trade name "Dry-Ice"—the first time it had ever had any commercial name.

Something had happened to introduce a change and open solid carbon dioxide to a wide field of usefulness.

That "something" was the Slate invention disclosed in the patent in suit.

Slate's fundamental invention was disclosed in a parent application filed January 10, 1924, which showed the generically novel inventive principles and also certain specific applications thereof.

A divisional application was filed September 27, 1924, based on the parent case and covering one of the specific applications of the invention. That divisional application eventuated in the patent here in suit which issued August 10, 1926.

The patent (p. 187) covers the fundamental invention as applied to the refrigeration of foodstuffs in packages for transportation over long distances with perfect preservation of the foodstuffs in frozen condition.

The patent recognizes what had been known for many years (p. 3, *supra*), namely, that carbon dioxide has only twice the refrigerating value of water ice—it "affords nearly twice as much refrigerating value per pound" (patent in suit, p. 188).

But, when the carbon dioxide is arranged and coordinated with the other elements of the combination as specified in the patent—the solid carbon dioxide being "less accessible for exterior heat than the freezable products" which "are insulated by the gas evaporated," which gas "escapes in freezing and insulating relation to said materials", as expressed in the claims—the refrigerating *efficiency* of the solid carbon dioxide is as high as *fifteen to twenty times* as great as that of water ice, as even Petitioners' President Ditmars admits (Plffs.' Ex. 16, p. 202) and as the evidence shows (p. 16, *infra*).

The invention is a "refrigerating apparatus" which combines (1) solid carbon dioxide, the refrigerant of distinctive properties essential to the combination; (2) the foodstuff, such as ice cream or the like, which is to be kept in frozen condition, and (3) an enveloping container, each element of the combination being arranged in a specified rela-

tion to the other—a relationship never previously suggested, and producing strikingly novel and valuable results never supposed possible prior to Slate's invention.

The specific arrangement set forth in the patent for obtaining the desired results to the highest degree is (p. 187) to have the

> "frozen carbon dioxide enclosed in a suitably insulated container which has the products to be refrigerated above, below and around it * * *"

The location of the solid carbon dioxide, irrespective of whether or not it is in the geometrical center, is further variously described as "in or among" (p. 188) or more specifically, "in the midst," or still more specifically, "midway" of the products to be shipped.

With this arrangement the solid carbon dioxide directly absorbs heat which comes through the walls of the box containing the solid, and from the perishable products around that container (p.187). This (p. 187) produces

> "a corresponding amount of intensely cold carbon dioxide *gas* without any intermediate liquid state, said gas being liberated *in operative relation* to refrigerate such products, dry them and protect them from air."

The gas "forces its way under the lid of the chamber" in which the frozen carbon dioxide is contained, "and continuously keeps the air and moisture displaced" (p. 188).

The specific arrangement in which "the carbon dioxide is midway of the products to be preserved" is the particular "form of my invention" (p. 188) which is illustrated in the drawings of the patent.

The arrangement in which the frozen carbon dioxide is in direct freezing relation to some portions of the perishable products to be frozen (whether or not midway in them) is specifically covered by claim 2, which provides that the arrangement is such that "said gas, as formed, escapes in freezing and insulating relation to said materials."

Claims 3 and 6 bring out the function of the gas and, specifically, the idea that the arrangement is such that the

products to be frozen protect the solid carbon dioxide from external heat, that is, "said frozen carbon dioxide is less accessible for exterior heat than said freezable products".

Claim 4 emphasizes that the freezable products are "insulated by the gas evaporated" from the solid carbon dioxide, that is, the constantly evolved cold gas tends to form a barrier between the outside heat and the products to be frozen.

The patent, and the claims, are not for carbon dioxide and are not for a container for carbon dioxide.

They are for a combination constituting, when the parts are arranged as specified, a novel package, or "transportation package" for transporting such a thing as ice cream and keeping it solid and intact until it reaches its destination.

The invention has revolutionized the transportation of ice cream. It has not only greatly reduced shipping and handling charges because of the much lighter weight of the patented package, but also has eliminated entirely the messiness of dripping and leaky ice cream tubs, re-icing during shipment and, in most cases, return of the containers (p. 204 and Petitioner's advertisement on 2nd page following).

As we shall now show, the invention in issue was effective to make solid carbon dioxide a highly and economically useful refrigerant by reason of the patentee's discovery of the combination in which the characteristic properties of solid carbon dioxide are utilized to produce refrigeration on new principles.

ARGUMENT.

I.

The patent in suit discloses a real and meritorious invention.

The prior art had taught what were supposed to be the proper relationships between a refrigerant, the things to be refrigerated, and the enclosing chamber. For example, in shipping ice cream the ordinary practice was to pack water ice and salt in a tub around a can of ice cream. The water ice was interposed between the exterior heat and the product, which latter was cooled entirely by conduction. In the domestic refrigerator the water ice is placed in an upper compartment (the warmest part of the refrigerator) and cooling is effected by currents of air, cooled by the ice, descending, coming in contact with and taking up heat from the articles to be refrigerated, then rising to the ice, becoming again cooled, descending again, etc.

Slate rejected these teachings. He conceived that the mere substitution of solid carbon dioxide for water ice, in the old familiar relationship, was fundamentally wrong. He interposed the *product* to be refrigerated between the exterior heat and the refrigerant. He deliberately avoided convection currents. Instead of using the solid carbon dioxide merely as a heat-absorber, he utilized it also as a cold gas generator and pump which continually forces the cold gas through all the spaces and interstices of the package, carrying sufficient refrigeration to all parts, and constantly moving in one direction, outward, without return flow.

Slate's novel coordination of apparently simple elements brought about a complex series of actions and reactions and cooperative relationships (pp. 146-148).

Thus:

FIRST: Slate, by placing the solid carbon dioxide in its own container, maintains the solid in a bath of its own

evolved carbon dioxide gas, which has high heat-insulating value and therefore tends to protect the solid from external heat.

SECOND: He places the foodstuff around the container of solid carbon dioxide, thus imposing on the foodstuff itself the affirmative function of a heat-insulating medium for the protection of the refrigerant. In other words, the foodstuff is made to serve as an *operating element* in the patented combination—not only in the negative sense that it is to be refrigerated but in the positive sense that the foodstuff is one of the *working elements*, coordinated with the other elements, to preserve the refrigerant against too rapid destruction under the influence of external heat. This utilization of the things to be refrigerated as a medium of insulation and as a means of enhancing the efficiency of the refrigerant was one wholly novel phase of Slate's invention.

THIRD: He utilizes the cold, evolved gas in three ways: as a refrigerant, as a heat-insulator, and as a heat-purge, as we point out more in detail in a moment.

FOURTH: He adds another wall of insulation by enveloping the whole in an outer casing made of, or comprising, heat-insulating material. Besides serving as a further insulation, this outer casing largely confines the cold gas to hold it in refrigerating and insulating relation to the contents and, in addition, unifies the embodiment of the invention and maintains all of the cooperating elements in their intended relationships.

Those are the things and relationship specified in the claims (pp. 7-8, *supra*). This relationship between the elements results in the following actions and reactions taking place:

FIRST: Heat entering through the walls of the outer or enclosing container is slowly transmitted by conduction through the mass of foodstuff to the solid carbon dioxide.

Since the foodstuff is a poor conductor of heat, it serves as an excellent insulator.

SECOND: As the solid absorbs heat, it gives off about 500 volumes of gas for each unit volume of the solid (p. 142, fol. 205). The more rapidly the solid absorbs heat the more rapidly it turns into gas. The gas given off is extremely cold, 110° below zero, Fahrenheit.

THIRD: The gas continuously flows through the entire mass of foodstuff. Since the gas is much heavier than air, it sinks to the lowermost parts of the outer container and displaces air upwardly. Eventually the cold gas completely fills all the spaces within the outer container, envelops all the foodstuff, and effectively refrigerates even those portions of the foodstuff most remote from the solid CO_2 (p. 147).

FOURTH: Since the gas is an excellent heat insulator, and since it completely fills all spaces or voids within the outer container, it is evident that it performs a definite function in shielding both the foodstuff and the solid carbon dioxide from exterior heat (p. 147).

FIFTH: Since the gas is constantly being evolved from the solid, a continuous flow of cold gas keeps the outer container and the interstices between the parcels of foodstuffs always filled with a bath of gas that is constantly moving outward, constantly absorbing heat as it flows. This produces a valuable purging effect in that the gas receives and bodily transports, so to speak, the absorbed heat from the interior of the outer container to the outside atmosphere (p. 150).

SIXTH: One of the most striking things about Slate's apparatus is that it automatically and with extreme sensitiveness responds to changes in external temperatures. For example, if external temperature increases materially, heat increasingly penetrates the walls of the outer container, and

its effect slowly penetrates to the solid carbon dioxide. The result is that the speed of evolution of gas from the latter is increased—the gas flows at greater speed and in greater volume through the interstices of the foodstuff and into the outer atmosphere—with the effect of enhancing the refrigerating action commensurately with the penetration of heat from the outside (p. 151).

The solid carbon dioxide is an essential and distinctive element in the new apparatus in which the cold gas evolved from the solid carbon dioxide is utilized in an efficient manner. It is the presence of the solid carbon dioxide in the combination and its essential cooperative relationship with the other elements which constitute Slate's invention, distinguish it from all preceding knowledge and teachings, and establish its usefulness.

That what the patentee here did was not obvious, would seem to be apparent from the facts that,

First, although others had had the idea of using solid carbon dioxide as a refrigerant, they had proposed to use it as water ice had been used and merely in substitution for water ice; none of them had conceived that it might advantageously be used in such a manner as to take advantage of the very characteristics which differentiated it from water ice (see pp. 13-18, *infra*); and

Second, the results achieved clearly show that what Slate did was essentially different from what had preceded. Prior to his time it was well known that solid carbon dioxide had a refrigerant value nearly twice as great as water ice, and it seemed obvious *to the prior workers* that its refrigerating *efficiency* could not exceed that. But Slate so used the carbon dioxide as to cause it to have a much greater, and entirely unsuspected, efficiency (p. 8, *supra;* 16, *infra*). He did what it was obvious could not be done.

The record shows that prior to Slate's invention, all of the experts on both sides of the case believed that the "refrigerant value" ratio of two to one represented the maximum refrigerating effect that could be hoped for in any refrigerating apparatus no matter how efficient, and that this is far too small to permit substitution of expensive solid carbon dioxide in place of water ice, for ordinary refrigerating purposes. Consequently, when Petitioner's expert Churchill tests a package made in accordance with the Slate patent and finds (as we shall see in a moment) that it actually shows a refrigerating efficiency very much in excess of 2 to 1, such excess must be credited to the efficiency attainable by Slate's novel and ingenious arrangement.

Slate's patent correctly states the 2 to 1 refrigerant value for the frozen carbon dioxide (p. 3, *supra*). He devotes his attention entirely to improving *efficiency*, particularly by ingenious insulation effects which he produces. Slate, having disclosed the novel arrangement which brings into play these effects, was under no obligation to state or even to know just how much improvement in efficiency will result in any given case.

With his type of organization, he obtains refrigerating effects many times the known ice ratio of two to one, a fact which prior to Slate was unsuspected even by Petitioner's experts Starr, Churchill and Goosman, and by Respondents' expert Jones, all of whom had been workers in this field, some of them for many years prior to Slate's invention. That is, Slate taught how to increase the effective refrigerating effects obtainable with carbon dioxide ice from twice that of water ice to many times that of water ice, the actual result being admitted by Petitioner's president, Ditmars, to be as high as fifteen or twenty to one (p. 8, *supra*, 16 *infra*).

Petitioner's expert, Starr, reiterated on the stand his belief in the 2 to 1 ratio as a standard for judging the maximum refrigerating results that may be obtained when solid carbon dioxide is used instead of water ice (p. 87-88). But Petitioner's other experts, Goosmann and Churchill, ad-

mitted that such a hypothesis is wrong and ignores substantial considerations, as the following will show:

Dr. Goosmann, in his article published in May, 1926 (Plffs.' Ex. 21, p. 209), ridiculed the pretentions of Respondents, and expressed the accepted 2 to 1 ice ratio belief as to the refrigerating results obtainable with solid carbon dioxide (p. 216). But he *testified* that that solid could not be used to cool water in the ordinary way because of its different characteristics (p. 122) and that it could not be compared with water ice because of such characteristics (p. 123) for refrigerating purposes.

When he testified (after full knowledge of Slate's results) he had changed his opinion for the reason that solidified carbon dioxide has a number of functions or advantages not found in water ice—that is, the insulating value of the evaporating gas which prevents the ready heat leakage from the outside into the refrigerator on account of the low conductivity of the gas and the fact that the evaporation of the solidified carbon dioxide creates a slight outflow pressure—which he ignored when he wrote about the Slate inventions in May, 1926 (pp. 123-124).

Goosmann admits, also, that while his writings have been extensive on the subject of solid carbon dioxide, the only use that he has mentioned is for medical purposes (p. 122).

Also, Petitioner's expert, Churchill, who also experimented with solid carbon dioxide, says that he recognized nothing unusual about his early experiments (p. 74). But when, in 1927, he shipped ice cream to his niece in Portland, Oregon, in a paper package weighing 60 pounds, and the ice cream arrived like a block of cement, and only 22 pounds of the solid CO_2 had sublimed in the transit of 6 or 7 days, he knew *something* had happened that his knowledge of solid carbon dioxide made unpredictable. His comment was (p. 74):

> "It was shown that a much greater amount of refrigeration would have been required than was shown

by the melting of the 22 pounds of dry ice on the trip. The ice cream arrived like blocks of cement; it took about ten hours to thaw it out so that it could be eaten."

So, clearly, Churchill recognized in 1927 that far better refrigerating results had been obtained than could have been accounted for on the old 2 to 1 ratio.

And Dr. Jones, Respondents' expert, points out that in 1923 he was unable to interest the carbon dioxide manufacturers in the manufacture of the solid, because of their and his belief that the refrigerating value of solid carbon dioxide is only twice that of water ice (p. 144). *He explains that as a matter of fact with solid carbon dioxide used in a refrigerator like ordinary ice all one could expect to, or would get, would be in the ice ratio of 2 to 1* (p. 145), *and Petitioner's witness, Starr, corroborates him* (pp. 80, 87).

Respondents' witness, Lavedan, also referred to the scepticism of the Liquid Carbonic Company when approached about September, 1923, with the idea of supplying large quantities of liquid carbon dioxide, for the manufacture of the solid, to the Respondents' predecessor, saying (p. 138):

"* * * We investigated the proposition from that standpoint, because from our standpoint, if we had excess capacity in our plant, we would be delighted to sell the gas, but there was a doubt in our minds, and the engineers' minds, as to the economic feasibility of it, and as it involved the outlay of much money on our part to change our plant we handled the matter in a conservative way from the outset. Most of the engineers of our plant were of the opinion in 1923 there was a fair possibility *this material could not possibly be used practically*, or on an economic basis, as it had been described to us."

Plaintiff's witness, Jones, also very graphically describes his amazement and unbelief when in 1924 he first heard of the remarkable performances of Respondents' packages in which one pound of solid carbon dioxide replaced 10 to 12 pounds of water ice (p. 144).

The fact that solid CO_2 was not used as a refrigerant prior to Slate is made clear by Lavedan, in charge of the sales of Liquid Carbonic Co., the largest carbon dioxide manufacturer in the country. The only uses of the solid which he had ever heard of were with reference to the liquid being converted by users into solid for the treatment of skin diseases and for the calibration of thermometers (p. 138). Prior to 1923, when the Liquid Carbonic Co. began to supply the raw material to Respondents' predecessor for conversion to solid, the Liquid Carbonic Co. *had no inquiries for the solid.* Since then it has taken up a lot of Lavedan's time answering such inquiries (p. 139).

And McIlvain, in charge of the development work of the Respondents, testified that the ordinary way of shipping 5 gallons (40 pints) of ice cream is to refrigerate it with 70 pounds of ice and 17½ pounds of salt, whereas a Slate package like Exhibit 12 (p. 197) which carries 50 pints of ice cream, can be shipped for twenty-four hours refrigerated with only 6 pounds of solid carbon dioxide (p. 158). Six pounds of solid CO_2 to eighty-seven and one-half pounds of water ice and salt are in a ratio of 14.6 to 1. As, however, Respondents' package contains 1¼ times as much ice-cream as the 5 gallon can, and as the time of shipping is ⅓ longer, the ratio advantage is more than 24 to 1.

And if further evidence were needed as to the merits of the Respondents' patented combination, we have the laudatory comments of Dittmars, President of the Petitioner, in an address to the Eastern Ice Association, in which he stated in part (pp. 202-3-4):

> *"The expanding property of solid carbonic serves to make it from 15 to 20 times as effective as ordinary ice,* at the same time guaranteeing a clean, dry package. If the solid carbonic is so packed that it surrounds itself with cold gas, its rate of evaporation is slowed up materially and it lasts much longer.
>
> * * * * * *
>
> "Several of the largest and most prominent ice cream manufacturers, caterers, fish companies and meat packers are using solidified carbon dioxide for shipping pur-

poses. Numerous tests have demonstrated to these firms the advantages of using carbon dioxide ice as a means to extend their markets tremendously.

* * * * * *

"The savings effected by the use of so convenient a refrigerant is evident from the fact that single charges of carbon dioxide have maintained perfect refrigeration in a car over a journey ordinarily requiring many re-icings.

* * * * * *

"The evaporation of carbon dioxide to a dry gas not only makes feasible its use *in paper or cardboard containers* for small-lot shipments without the necessity of the return of empty tubs or barrels, but for carload freight it also reduces the maintenance cost on refrigerator car equipment."

The Petitioner's advertisement in the May, 1927, *Ice Cream Journal* (following p. 204) gives further corroboration on the advantages of the Slate invention, saying in part as follows:

"The ice and salt method of refrigerating ice cream, always wasteful and disagreeable, is on its way to the industrial scrapheap. Science presents CARBICE (Solidified CO_2) the *new* refrigerant, with remarkable advantages to the Ice Cream industry.

"With Carbice you can ship ice cream by express or parcel post, without leakage or drip, in a *'throw away' paper package.* Whatever the distance the ice cream will arrive in perfect condition, without re-icing. Following are some of the outstanding advantages of Carbice over water ice and salt:

"No picking up or shipping back of containers.
"Extends shipping radius.
"Greatly reduces express charges by reason of less weight and bulk and no container returns.
"No re-icing during shipping.
"Solves problem of retail carryout trade and sale to auto parties, picknickers, tourists.

* * * * *

"Provides clean, sanitary-appearing and smaller package; more convenient for customer to handle.

"No leaking or dripping of package and no briny residue for Dealer or Consumer to dispose of.

"No more tubs and cans with attendant repainting and repairs."

"Takes up less storage space.

* * * * * *

"Exact amount of Carbice can be determined for proper refrigeration of any size package for given length of time."

The proofs thus show that in Slate's novel combination the efficiencies developed astonished all of the experts, including Petitioner's expert Prof. Churchill, who had been convinced and gone on record before the trial, as having been converted, and Mr. Starr, who had for many years considered it axiomatic that solid carbon dioxide could not be even twice as efficient as water ice, and Dr. Goosmann who had also reckoned the refrigerating efficiency as less than twice that of water ice. The results shown by the proofs are that the actual working efficiencies are from 15 to 24 times the efficiencies of water ice (p. 16, *supra*).

As the result of those unexpected efficiencies, a demand for millions of pounds of frozen carbon dioxide has been created and supplied, thus displacing water ice in the commercial refrigeration of ice cream by a substance which has never been a commercial commodity for any purpose, and which for ninety years had remained a curiosity, a scientific laboratory substance.

And yet, after all, what Slate *did* was a simple thing, simple enough so that it made Respondents' witness, Jones, who had made an exhaustive investigation in this very field, say (p. 151):

"* * * I feel somewhat ashamed myself of not having invented this thing before the inventor did, because I ought to frankly admit in the light of the disclosure and after results have been obtained, that it sounds awfully simple."

That is, the thing done was simple, but it involved the conception of an underlying idea which was radically new with

Slate, in spite of the fact that many others had been working on the problem.

In *Kurts* v. *Belle Hat Lining Co.*, 280 Fed. 277, 279, 282, a case relating to a patented hat lining, the Circuit Court of Appeals for the Second Circuit quoted with approval from *Cunningham* v. *Aeolian*, 255 Fed. 879, 900, as follows:

> "It was a true discovery. It involved uncovering a thing which, while long capable of being done, was never before thought of. It also afforded a medium or means for bringing the discovery into practical action, and put it into the hands of others, there to be turned to pleasurable and profitable uses."

In *Yablick* v. *Protecto Safety Appliance Corporation*, 21 F. (2nd) 885, the Circuit Court of Appeals for the Third Circuit, in sustaining the patent which was for the use of copper sulphate in a gas mask canister through which the wearer breathed, said:

> "The patentees translated a more or less isolated and hitherto comparatively unimportant fact of chemistry into a useful industry."

The foregoing expressions of the Courts might well have been written about Slate's invention.

The portion of the opinion of the Circuit Court of Appeals, in the present case, dealing with the matter of invention is at pages 442-444 of the Transcript, and terminates with the conclusion that Respondents are justly entitled to assert that they "have created a new industry".

II.

The invention is properly claimed in the patent.

The thing which the patentee of the patent in suit did which resulted in creating a new industry by making it possible and economically practical to use solid carbon dioxide as a refrigerant, is based upon the discovery that, if the solid carbon dioxide is so placed as to have a certain relation to the location of the articles to be refrigerated, the peculiar characteristics of that particular refrigerant may be utilized. That is, the very cold gas evolved from the solid carbon dioxide may take an active part in the refrigeration and in protecting the solid carbon dioxide so that it has a longer life.

He embodied this discovery in a transportation package consisting of several parts in a specified relation to each other. That package is manufactured, just as any machine is manufactured.

Every machine is made up of various parts, such as wheels, levers, screws, pistons, etc., and most of the elements are, in themselves, old; the machine is made as a complete operative whole by assembling the various old parts in a specified relation to each other so that they may work in accord with the designed plan, to produce the desired results. If the plan and results are new and useful, the machine is patentable.

So, also, in the case of the transportation package here involved, the package is made by bringing together old things in a specified and new relation to each other, with new, unexpected and highly advantageous results.

The combination constituting the package is recited in the claims in suit. For example, claim 3, which is fairly typical, is as follows:

"3. A transportation package consisting of

(1) a vented protective casing of insulating material enclosing

(2) a quantity of frozen carbon dioxide sufficient to afford refrigeration for the desired period and

(3) a quantity of freezable product in *freezing proximity* to said carbon dioxide and *the gas* evaporated therefrom and arranged so that said frozen carbon dioxide is *less accessible for exterior heat* than said freezable products."

The other claims relied upon, namely, claims 2, 4 and 6, likewise bring out the essentials of the combination (see p. 7-8, *supra*).

All of the claims in suit specify the elements of the combination constituting the complete transportation package, and their relation to each other, which relation is essential to carrying out the principles of the operation and achieving the results which we have enumerated at pages 9-12, *supra*. The solid carbon dioxide *when having the relation to the other elements as specified in the claims*, is not quiescent but, on the contrary, carries on an operation much as operations are carried on by a machine. It not only cools the adjacent perishable products, but, also, actively and continuously produces cold gas which permeates through the rest of the package and continuously cools all of the contents and continuously forces out the warmer air and also protects the solid carbon dioxide from too rapidly changing into gas.

Many, and it may be, all of the parts of the combination are transient in character. The solid carbon dioxide is supposed to be used only in sufficient quantity, that is, enough to last only until the end of the journey of the transportation packages, when it will all have disappeared into gas. The ice cream is to be removed and eaten. The paper in which the solid carbon dioxide was wrapped is undoubtedly thrown away. The outer casing of the package may be of paper, or cardboard, which may be, and usually is, thrown away after one use; the Petitioner's advertisements speak of it as a "'throw away' paper package" (p. 17, *supra*).

Probably there is no combination of any parts, or ele-

ments, which has an indefinite life and usefulness. Some last longer than others. A familiar instance of this is afforded by the Edison incandescent electric lamp, the patent for which was sustained more often, probably, than was any other patent. The article consisted of a carbon filament located in a vacuum in a glass enclosure. As in the present case, the usefulness of the article depended entirely on the relative arrangement of the parts. And, as in the present case, the article had but a short life; we certainly remember that the carbon filament soon "burned out". But, while it lasted, the article consisted of a real and very useful combination of parts.

The article, the complete "package", in the present case may last, and is intended to last, only until it has once performed its functions. But, while it lasts, it is made up of a combination characterized by such parts and arrangement of parts that it performs very definite functions, utilizing to the fullest extent and in a new way the heat absorbing properties of solid carbon dioxide and the cooling and insulating properties of the gas evolved from it.

We discuss this point further in our reply to Petitioner's brief (pp. 43-50, *infra*).

III.

The Petitioner Infringes.

Petitioner is charged with contributory infringement.

The evidence shows, as we shall point out, that Marchiony (the primary infringer) at one time had purchased solid carbon dioxide from Respondent and employed it, under Respondent's limited permission, in making the "refrigerating apparatus" of the patent in suit.

Petitioner induced Marchiony to buy solid carbon dioxide from Petitioner, for use in making "refrigerating apparatus"

exactly like that previously made by Marchiony in accordance with the patent in suit. Petitioner is shown to have had full knowledge of the facts and to have intended that its solid carbon dioxide be used by Marchiony just as he had previously used Respondent's.

The primary infringement by Marchiony is not open to plausible argument. The Circuit Court of Appeals found:

> "There can be no reasonable doubt about the defendant's [petitioner's] complicity in Marchiony's infringement of the patent, which is all one means by contributory infringement".

Petitioner sold Marchiony the solid carbon dioxide intending it to be used by him in *constructing* an indefinite number of embodiments of Respondent's patented combination, the Petitioner thus knowingly contributing the major element essential to each such act of construction.

This Court has stated the general rule, in *Leeds & Catlin Co.* v. *Victor Talking Machine Co.*, 213 U. S. 325, 29 S. C. 503, thus:

> "* * * petitioner had made and sold a single element of the claims of the Berliner patent, with the intent that it should be united to the other element and complete the combination, and this is *infringement.*"

In the same opinion it was said:

> "A combination is a composition of elements, some of which may be old and others new, or all old or all new. It is, however, the combination that is the invention, and is as much a unit in contemplation of the law as a single or non-composite instrument. Whoever uses it without permission is an infringer of it. *Whoever contributes to such use is an infringer of it*".

Now we shall review the facts relating to infringement in the present case.

The Respondents began their business under the patent in suit in 1925 and, as we have seen, immediately created a

very large commercial use of solid carbon dioxide, whereas no such use had theretofore existed, though efforts had previously been made to find such a use for it.

After the Respondents had, in accordance with the invention of the patent in suit, created and established this business and had educated customers as to how to make the patented package to exhibit its advantages to the highest degree, the Petitioner entered this business.

The Petitioner was promptly given notice of infringement of the patent in suit by letter to Ditmars (p. 198, fol. 289), who was president of the Petitioner (p. 35); and the Petitioner itself was likewise notified (p. 209, fol. 301).

The Petitioner, like the Respondents, does not sell the complete packages but makes and sells the solid carbon dioxide to be used in accordance with the teachings of the patent in suit.

The Petitioner's course from the beginning has been directed to appropriating Respondents' business under the patent in suit. Ditmars organized and became president of Petitioner in July, 1926 (p. 35). In August, 1926, not representing himself in his true light as a future competitor but as connected with a prospective customer, he called on Martin, of the Respondents, who says (p. 21):

> "On August 5th of 1926 * * * Mr. Ditmars called in my office and we discussed the manufacture and sale of 'Dry Ice', he at that time representing himself to be connected with the Southern Dairies, Inc., I think it is, of Washington, whom we desired to obtain as a customer for the next season."

Next, on October 15th, Ditmars again called on the Respondents and requested to be allowed to visit their plant. As his activities were then known, that request was refused (p. 21).

Shortly after that, on October 27, 1926, Respondents notified Ditmars of his and his associates' infringements; the notice appears as Exhibit 15 (p. 198).

Petitioner's commercial operations began early in 1927, and were patterned as closely as possible after Respondents'. Its name, Carbice Corporation of America, is as near Respondents' "Dry Ice Corporation of America" as it dared go. Respondents' trade name "Dry-Ice"; Petitioner's "Carbice". Respondents sell to their customers only the solid; so does Petitioner.

What the Petitioner did was to go direct to Respondents' customers and offer to sell its solid CO_2 at the lower price of 4½ cents. It, of course, was put to no development expense, as it had the benefit of Respondents' experience, and all it had to do was to say to Respondents' customers "Use our solid carbon dioxide instead of the Respondents' and the package will give you just as good results". And, of course, the package did give the same results, for it used solid carbon dioxide in exactly the same way to refrigerate ice cream in containers of the same sort as those originally recommended by Respondents.

Of course Respondents lost business to Petitioner. Ten former customers of Respondents bought solid CO_2, during 1927 from Petitioner instead of Respondents (pp. 20, 206-07).

Respondents, so as to save the Court from having to consider the many variations of Slate's package in which Petitioner's product has been knowingly assembled, has taken the unauthorized use of Petitioner's product by Marchiony, in two different forms, as typical cases of infringement (pp. 29-30, and second and third pages following page 196) which are Chinese copies of what is shown in the patent in suit.

The circumstances of the Marchiony use make it perfectly evident that Marchiony did assemble the various elements of the claims into the patented combination without the consent of Respondents, and that the Petitioner after due notice of infringement did sell solid carbon dioxide to Marchiony, knowing exactly how Marchiony was to use it and intending that it should be assembled and used by Marchiony in the patented combination in exactly the same

way that Marchiony had assembled the Respondents' product in the patented combination prior to the Petitioner's sales to Marchiony.

Marchiony's testimony describes such use of the invention in question (pp. 28-30):

> "We use various insulated containers of corrugated board or Balsa board, mineral wool, and so forth, and we pack the ice cream around the container and place the solid carbon dioxide in the center so as to refrigerate the contents, the ice cream. In speaking of packing the ice cream around the container, I mean around the inside walls of the container. The ice cream is usually put up and packed in pint and quart packages.
>
> "This is a cardboard carton, one of our usual cartons for packing our ice cream.
>
> * * * * * *
>
> "The box [Plaintiff's Exhibit 9] shown to me is a corrugated box insulated with corrugated board, and the ice cream is placed inside the box. The ice is placed in the center of the box. This is one of the containers which we use in shipping our ice cream to various places. In the brown paper in the upper middle portion is solid carbon dioxide wrapped in wrapping paper. In this box the ice cream is placed in cartons similar to the one just offered in evidence.
>
> * * * * * *
>
> "We use a Balsa wood box for shipping our ice cream. This is such a box.
>
> "By the Court:
>
> "Q. That is for shipping long distances? A. Shipping long distances.
>
> * * * * * *
>
> "The drawing handed me correctly shows the way the ice cream and solid CO_2 are packed in our shipping cases. This is the way and method which we use in packing ice cream in the container.
>
> "Marked Plaintiff's Exhibit 11 in evidence [see second page following page 196 of the Transcript].
>
> * * * * * *

"The sketch handed me of a box somewhat similar to the corrugated paper carton heretofore offered in evidence, shows the way we used the refrigerant and the material refrigerated.

* * * * * *

"Marked Plaintiff's Exhibit 12 in evidence [see third page following page 196 of the Transcript].

* * * * * *

"We began using these various ways of packing and refrigerating ice cream about October, 1925, I believe."

So all these uses of the invention were being carried on by Marchiony when he was approached by Clark, of the Carbice Company, in March, 1927.

Marchiony purchased solid carbon dioxide from the Petitioner for about two months at the lower price of 4½ cents (p. 31). In connection with getting these orders, Marchiony wrote to the Petitioner the following letter, dated March 15 (p. 197):

"Referring to your offer to sell us Dry ice at 4½c per pound, as this is cheaper than we are able to buy solid carbon dioxide from the Dryice Corporation, we are willing to try out your product at the price in question, provided that you will give us a written assurance that it will give us as satisfactory results in shipping ice cream *under our present conditions of use* as the product of the Dryice Corporation and you will be prepared to keep us supplied after we begin using it.

"In justice to ourselves we cannot change our present source of supply other than as above stated."

And received in reply Petitioner's letter of March 18, as follows (p. 198):

"Replying to your letter of March 15th, we hereby guarantee to make daily deliveries of Carbice to you in any quantities you may desire. Further, in an emergency, we will make delivery to you within two hours between 8 A. M. and 6 P. M.

"We also guarantee that Carbice will be found as satisfactory as dry ice in any and every way, and being made under greater compression than the latter product, will prove to be a more efficient refrigerant.

"Assuring you we will cooperate with you in every way and advise you as to the most economical use of our product, we remain."

That is, the Petitioner gave the written assurance that Marchiony asked for, that the Petitioner's product "will give as satisfactory results in shipping ice cream *under our present conditions of use* as the product of the Dry Ice Corporation." And Marchiony states that the solid carbon dioxide purchased from the Petitioner was used "as stated before in the same manner, form and method", and that there was no change or difference in the way he was using the solid carbon dioxide purchased from Carbice from that purchased from the Respondents (p. 31).

Hence, it is clear that Petitioner did supply Marchiony with solid carbon dioxide knowing exactly how it was to be used, and that it was to go into the combination of the patent, as comparison of the patent drawing (following page 186) with drawings (second and third pages following p. 196) of Petitioner's packages will show, the patent drawing being almost identical as to structure and arrangement.

Under cross-examination it was brought out that Marchiony changed the places from which he was getting both his inside ice cream cartons and the outside container cartons. His testimony thereon is as follows (p. 32):

"Q. And I think you also testified that when the dry ice people first interested you in using solid carbon dioxide they told you where you could get the cartons, and you did not change the place you were getting your ice cream cartons from, did you?

A. Yes, we did change. We got the ice cream cartons from a different place. A different printer made up our cartons at various times, depending on the price submitted and the quantities. The price and delivery was an important feature for us, and we changed the places

we got the outside cartons, depending on price and delivery. We do not get the consent of the Dry Ice Company each time we change the place where we get our ice cream cartons or outside cartons."

The above makes evident that the containers were a commercial commodity subject to ordinary practices of barter and sale and that Respondents' customers always bought these wherever they could make the best bargain.

Petitioner sold its product, solid carbon dioxide, with the intent that it should be used by Marchiony and others of Respondents' customers as an element of Respondents' patented combination.

The Marchiony packages using Petitioner's solid carbon dioxide clearly infringe; and the Petitioner, in selling that refrigerant, for use for that purpose, is clearly a contributory infringer.

In the patented combination, the solid carbon dioxide is the essential and vital element that has no equivalent. It is not only the primary refrigerant but also the source of the dry gas that does the insulating, air removing, moisture removing and heat removing. It is not a commercial commodity except as and to the extent that Slate's inventions have created a demand for it. He changed it from a rare curiosity into a great commercial success. In all of these respects, the solid carbon dioxide is unique and differs from the other elements of the combination in that the latter admit of infinite variations and equivalents and have long been commercial commodities.

The Petitioner has not attempted to show that Marchiony or any of its customers might have used the vital element in a non-infringing way, for it is clear that the intention was to have the Petitioner's solid carbon dioxide used in exactly the same way that Respondents had instructed their customers the material should be used in assembling Respondents' patented combination. This is further evidenced in Petitioner's advertisement (*supra*, pp. 17-18).

The doctrine which should control the decision in the

case at bar is that announced by this Court in the *Leeds* v. *Catlin* case, 213 U. S. 325, from which we have quoted at page 23, *supra*. And the facts in that case are so closely parallel to those in the instant case, as to warrant a more extended comparison. Typical claims in issue in each case are as follows:

Leeds & Catlin claim.	*Slate's claim.*
"35. In a sound-reproducing apparatus, consisting of	"3. a transportation package consisting of
	"a vented protective casing of insulating material enclosing
"A TRAVELLING TABLET HAVING A SOUND RECORD FORMED THEREON	"a quantity of FROZEN CARBON DIOXIDE SUFFICIENT TO AFFORD REFRIGERATION FOR THE DESIRED PERIOD.
"and reproducing stylus shaped for engagement with said record and free to be vibrated and propelled by the same, substantially as described."	and a quantity of freezable product in freezing proximity to said carbon dioxide and the gas evaporated therefrom and arranged so that said frozen carbon dioxide is less accessible for exterior heat than said freezable products."

In the Leeds & Catlin claim, the "travelling tablet having a sound record formed thereon" is the *dynamic element* that performs the primary function of causing the *relatively passive* "reproducing stylus * * * to be vibrated and propelled". In Slate's claim 3 the "quantity of frozen carbon dioxide" is the *dynamic element* that performs the primary refrigerating function, and causes the two other *relatively*

passive elements,—the "protective casing" and the "freezable product"— to perform affirmative functions.

The pertinent analogy is that the Leeds & Catlin claim and the Slate claim each recites a primary dynamic element and relatively passive elements. The complaint in the *Leeds & Catlin* case, as in the present case, was that the sale of the primary dynamic element (although itself unpatented) with intent that it be used with the other elements to construct the claimed combination, constituted contributory infringement.

In the *Leeds & Catlin* case the Court said:

> "It will be observed how *important* the record [the disc] is to the invention embodied in the claims. It is the undulations in the side walls of the spiral groove which vibrate the stylus back and forth, transmitting the recorded sound waves to the diaphragm, at the same time propelling the stylus as it engages with the record."

Likewise, it will be observed how *important* the solid carbon dioxide is to the invention embodied in Slate's claims. It is the low temperature of the solid carbon dioxide, and its continuous emission of cold gas, which refrigerate and insulate the "freezable product" and fill the "protective casing" with the cold gas, thereby initiating the responsive functions of both "product" and "casing" which enhance and prolong the efficiency of the solid carbon dioxide.

Further, this Court said:

> "If a comparison may be made between the *importance* of the elements, as high a degree (if not a higher degree), must be awarded to the disc with its lateral undulations as to the stylus." * * *
>
> "It is the disc that serves to distinguish the invention,—to mark the advance upon the prior art."

If a comparison may be made between the *importance* of the elements, certainly a very much higher degree of import-

ance must be awarded to the solid carbon dioxide and its cold gas, than to the other elements. And it is the solid carbon dioxide, with its enhanced efficiency in the specific relation in which it is used in the claimed combination, that serves to distinguish the invention—to mark the advance upon the prior art.

Further, in the *Leeds & Catlin* case, this Court said:

> "* * * the plaintiff in error [petitioner] knew and sold its records with the knowledge that, if its output was to be used at all by the public, it would be used with the Victor machine and in the combination protected by the claims of the Berliner patent, above referred to".

Likewise, the present petitioner knew, and sold its solid carbon dioxide with the proved knowledge and intent that it was to be used in the combination protected by the claims of the Slate patent. And this is infringement.

The Petitioner, as well as others, is perfectly free, so far as concerns the patent in suit, to make and sell solid carbon dioxide to be used in combinations other than that of the patent in suit. That patent is not for solid carbon dioxide nor does it attempt to monopolize that product. The Petitioner, however, knows full well that the product it sells is to be used in the exact way Slate taught in order that it may have a large refrigerating efficiency and thus more than compensate for its high cost as compared with that of water ice.

We discuss this matter of infringement further in our reply to Petitioner's brief (pp. 34-44, *infra*).

IV.

Reply to Petitioner's Brief.

We shall here consider the Petitioner's brief topic by topic, in the order appearing in that brief.

1. Petitioner, on pages 15 and 16 of its brief, refers to four refrigeration cases previously decided by this Court, and, as to one of them, concludes that "the close analogy between the alleged invention in the above case and the alleged invention of the case at bar is believed to be striking". There is no such analogy; but the case referred to furnishes an illuminating contrast with the present one.

In that case, *Brown* v. *Piper*, 91 U. S. 37, it appeared that the claim was for "preserving fish or other articles in a close chamber by means of a freezing mixture having no contact with the atmosphere of the freezing chamber". This was held to be completely and directly anticipated by a prior corpse preserver and by other existing knowledge* which had been applied by the patentee "without the development of any idea which can be deemed new and original in the sense of the patent law. The thing was within the circle of what was well known before and belonged to the public".

Similarly, in each of the three other cases cited at the foot of page 15 of Petitioner's brief, the patent was held anticipated as involving only ideas which were old.

In the present case, on the contrary, the idea was radically new, namely, that the large volume of cold gas continuously given off by solid carbon dioxide could be utilized, in addition to the direct refrigerating effect of the solid itself, to act as a refrigerant and to prevent warm air from entering

* The Court took judicial knowledge of an ice cream freezer. And it is interesting to note that that freezer was one in which the ice surrounded the article to be frozen (91 U. S. 44), as is the case in the known forms of freezer where water ice is employed. It is such a teaching of the prior art that the patentee of the patent in suit discarded in so utilizing the characteristics of solid carbon dioxide as to make it extrordinarily efficient as a commercial refrigerant.

the package, to drive out such air as is there and, together with the food products surrounding the solid, to help to insulate the solid to prevent its too rapid change to a gaseous state. The embodiment of this idea involved a specific arrangement of the solid with reference to the food products, by which they, too, took on affirmative function. The idea was new. The arrangement was new. And the results were almost unbelievable—there were strenuous doubters who were converted by experience (p. 13-16, *supra*).

All of this—the fact that, by the use of this invention the refrigerating *efficiency* of the solid carbon dioxide can be made to be 15 to 24 times as great as that of water ice, though its refrigerating *value* as measured by the number of heat units required to melt a given quantity of the solid is only twice that of water ice—is entirely overlooked in Petitioner's brief.

2. The Petitioner's brief, at pages 16 to 22, argues that the Petitioner's sale of the solid carbon dioxide *cannot* constitute contributory infringement, on the basis of the decision of this Court in *Morgan Envelope Company* v. *Albany Paper Co.*, 152 U. S. 425. At the top of page 17 of its brief, Petitioner purports to state the facts to be had in mind in this connection. But there are additional pertinent facts.

The Petitioner sells solid carbon dioxide for use in making up the patented combination. That solid, when so purchased, is not combined with other and permanent parts purchased from the Respondents. The Respondents have sold no fixture or machine (such as the fixture to hold the oval paper roll of the *Morgan* case, or a wood cutting machine) which is to operate on things which are expected to be used up and require renewal. When the Respondents sell solid carbon dioxide, they do not sell the casing of the package and do not sell the food product which becomes a part of the package. When the transportation package reaches its destination, the solid carbon dioxide has disappeared (it having gone off in the form of a gas), the food product is removed for consumption, and the casing is usually thrown away, as

it is usually merely a card-board carton adapted for use only once (p. 196, fols. 285-6; p. 204, fol. 293). In some instances a light wooden box is used as the casing of the package; but there is no evidence that the Petitioner sold its solid carbon dioxide for use only in a casing which had once been used with Respondents' solid carbon dioxide.*

So the Petitioner is not at all in the position of selling something like the paper roll to be used for renewal in the fixture in the *Morgan* case, or like logs to be operated on by a patented sawing machine. It is contributing to the making of the patented combination from the beginning.

The Court of Appeals, in its decision, rightly concluded that the *Morgan Envelope* case had no application to the case at bar, stating (pp. 451-452):

> "Whether the Morgan Envelope opinion be interpreted as a holding that the combination of fixture and paper roll was not a patentable combination, despite its somewhat perfunctorily asserted assumption to the contrary, or whether it be interpreted as an exception to the rule of contributory infringement, based upon implied license to renew ephemeral and subordinate parts of a patented combination, we do not think it can control the

*Even if it had done so, or even if the Respondents had sold the container of the package, or the whole package, there would have arisen no license to renew the solid carbon dioxide. That could not be done without destroying the whole combination, element by element, that is, the solid carbon dioxide would have ceased to exist, the ice cream in the package would have been removed and the protective casing would have been opened. To provide new solid carbon dioxide, new articles to be refrigerated and to close the casing again would constitute a complete infringement—the manufacture of the package from the very beginning, just as in the case of the Edison electric lamp. When the filament burned out, a person desiring to insert a new filament had to open the enclosing glass bulb, destroy the vacuum, remove the remaining portions of the filament, seal up the bulb again and create a new vacuum—and this was held to be an infringement of the patent on the combination of those elements—filament, vacuum and enclosing glass bulb. *Davis Electrical Works* v. *Edison Electric Light Co.*, 60 Fed. 276 (C. C. A. 1).

case at bar. *The doctrine of implied license to renew perishable and subordinate parts is based upon the purchase from the patentee of enduring and important parts of the patented combination.* Heyer *v.* Duplicator Co., 263 U. S. 100; Wilson *v.* Simpson, 9 How. 109; Williams *v.* Barnes, 234 F. 339 (C. C. A. 7); Heyer Duplicator Co. *v.* Ditto, 6 F. (2d) 578 (C. C. A. 7); Lyman Mfg. Co. *v.* Bassick Mfg. Co., 18 F. (2d) 29; Bassick Mfg. Co. *v.* Ready Auto Supply Co., 22 F. (2d) 331, 340 (D. C. E. D. N. Y.). In the Morgan Envelope case the implication arose from the purchase of a dispensing machine intended to deliver a subordinate element 'which must be renewed periodically whenever the device is put to use.' *Marchiony purchased nothing from the patentee except the dry ice.* When that evaporated in use he retained nothing acquired from the patentee from which to imply a license to renew or repair the purchased 'device.' It is true that the shipping box may be an enduring part of the patented package; and perhaps this should be considered as though purchased from the patentee, since its use in the combination was authorized although purchased from others. But to refill the shipping case with its vital element, the dry ice, would be not to renew a subordinate part but to reconstruct the patented package. That Mr. Justice Brown's opinion did not sanction *such a reconstruction* is clearly implied from his citation of Cotton Tie Co. *v.* Simmons, 106 U. S. 89, and his illustration of refilling the shell of a patented torpedo, to which we have already made reference."

So it is evident that the *Morgan Envelope* case is not in point, because the essential element that the Respondents sold, *i. e.*, the solid carbon dioxide, was not retained as the basis of making up other or subsequent transportation packages by the customer, but, instead, that essential element was the solid carbon dioxide purchased from the Petitioner.

In this same connection, the Petitioner refers, at pages 19 and 20 of its brief, to *Leeds & Catlin Co.* v. *Victor Talking Machine Co.*, 213 U. S. 325. This case, in so far as it has to do with the *Morgan* case, merely affirms and does not extend the doctrine of that case. It emphasizes that the "determining circumstance" in that case was that "the paper

perished by its use, and a periodical renewal was indicated 'whenever the device was put to use' ", which does not at all apply to the case at bar.

But this *Leeds & Catlin* case is of further interest in that it very definitely supports Respondents' and not Petitioner's position in the present case as we have shown at pages 23, 30, *supra*. Further, in that case this Court said:

> "The combination in the case at bar is valid, as we have unhesitatingly declared. The function it performs is the result of the joint action of the disc and the stylus. The disc is not a mere concomitant to the stylus; it co-acts with the stylus to produce the result. Indeed, as we have seen, it is the distinction of the invention, constituting, by its laterally undulating line of even depth and the effect thereof, the advance upon the prior art. To confound its active cooperation with *the mere passivity* of the paper in the mechanism described in the *Morgan Envelope Company* case is not only to confound essential distinctions made by the patent laws, but essential distinctions between entirely different things."

So, this Court has clearly defined the meaning of the *Morgan Envelope* case. And it is clear that it does not apply to the case at bar in which there is an "active cooperation" between the solid carbon dioxide and the other parts of the combination due to their relationship (see pp. 10-12, *supra*) and not "mere passivity" as in the case of the paper in the *Morgan Envelope* fixture. That is, in the sale of solid carbon dioxide with the intent that it be used in the patented combination, Petitioner was not furnishing merely a *passive element*, as in the *Morgan Envelope* case, but has been furnishing the cold-gas generator which gives Respondents' packages, in the relationship in which it is there used, the high refrigerating efficiency which has made them so successful.

The combination of the patent in suit results in active cooperation between the elements—not the mere passivity which exists between a cigar wrapper and a cigar, a box and the candy therein, or a bottle and its contents, as instanced

by the Petitioner. In the case at bar, one element and the gases evolved from it act on the other elements, and they on it—to perform functions and secure results not involved in or resultant from "mere passivity."

The *Leeds & Catlin* case also completely answers Petitioner's argument (p. 20) that because the solid carbon dioxide is perishable the furnishing of it cannot be construed as contributing to the infringement of any patent. In the *Leeds & Catlin* case the Court said:

> "And it would also seem on principle that there could be no license implied from difference in the durability of the elements or periodicity in their use."

Accordingly, the talk about the perishable nature of the solid carbon dioxide in the case at bar amounts to nothing. So long as this element exists, it is working and cooperating in the patentee's new ways, producing new results.

The Petitioner states at page 21 of its brief that

> "It is quite obvious, of course, that respondents are attempting, by means of the Slate patent, to create a monopoly in the unpatented commodity, solid carbon dioxide, for use as a refrigerant in the transportation of food stuffs."

This is neither "obvious" nor true. The Respondents make no claim to a monopoly of solid carbon dioxide. They have, however, discovered and patented one way in which to use it efficiently, and they are here objecting only to the Petitioner's infringement of that patent by contributing to the use of the solid *in that way*. The Petitioner may use it as it was used, or attempted to be used, in the prior art; it may use it in a new way if it devises some new way instead of attempting to take advantage of the one way covered by the patent in suit.

3. But the Petitioner urges, at pages 22-24 of its brief, that "there has been no infringement to which contribution could be made"—this on the theory that (a) Marchiony had first purchased solid carbon dioxide from the Respondents,

and was instructed where to obtain cartons for the transportation packages, and "was thereby, in legal effect, licensed" under Respondents' patents, and (b) "it was in these licensed packages and cartons that Marchiony packaged his ice cream and the refrigerant, solid carbon dioxide, obtained from both Respondents and Petitioner." Considering these two branches of the assertion separately:

(a) Respondent sold Marchiony solid carbon dioxide and nothing else. With each sale it issued to Marchiony a limited license, to use *the solid carbon dioxide then purchased from Respondents* in the combinations of the latter's patents. There is not a scintilla of evidence from which any license beyond this can be worked out.

Respondent advised Marchiony where he could obtain cartons suitable for his purpose. There was no privity between the supplier of cartons and Respondent. Petitioner's charge that the cartons carried a license from Respondent is based neither on fact nor on evidence.

(b) The Petitioner states that "it was in these licensed packages and cartons that Marchiony packaged his ice cream and the refrigerant, solid carbon dioxide, obtained from both Respondents and Petitioner." No. In connection with Marchiony's initial purchase of solid carbon dioxide from Respondent he was advised where he could get the cartons, but thereafter he obtained them wherever he saw fit dependent solely upon price and delivery as is shown by the Transcript and stated by Petitioner at pages 11-12 of its brief. Petitioner's contention, stated simply, is that once Marchiony had purchased a single pound of solid carbon dioxide from Respondent, and once he had been told where he might, if he wished, buy his cartons, then he could forthwith cease to buy solid carbon dioxide from Respondent but nevertheless would be forever after entitled to use Respondent's inventions. The absurdity and lack of even a vestige of equity in such a contention is obvious.

The Petitioner, however, attempts to construe the notice printed on Respondents' invoices (following p. 196) as bring-

ing the present case within the decision of this Court in *Motion Picture Patents Co.* v. *Universal Film Co.*, 243 U. S. 502. But that notice does not mention the patent in suit, nor have the Respondents ever provided any containers. They have approved them, of course, in instructing their customers what containers are best fitted for use with their solid carbon dioxide, and have given their customers the right to use the solid carbon dioxide, which they sell, in any suitable container. The notice amounts, at most, to a license to use Respondents' solid carbon dioxide in the transportation package. Certainly there is no restriction here such as is dealt with in the *Motion Picture Patents* case, where the attempt was made to restrict the use of the patented moving picture machines to licensed films.

Thus, the Court of Appeals was entirely correct, with reference to the *Motion Picture Patent* case, in stating (p. 449):

> "It is only *unpatented* materials *which form no part of the patented machine* which the Supreme Court held the purchaser of the machine may use at will. Marchiony might legally use defendant's carbice in any way not covered by the patent in suit, but he could not manufacture the patented package without plaintiff's consent, a consent which they withheld unless the vital ingredient of its manufacture was purchased from them. To extend the doctrine of the Motion Picture as defendant contends would completely destroy the monopoly of plaintiff's patent."

The opinion of this Court in the *Motion Picture* case supports this view, for it states clearly and unmistakably, in the reasons for its conclusion, that the film was not part of the invention (p. 518), saying:

> "Such a restriction is invalid because such a film is obviously not any part of the invention of the patent in suit; because it is an attempt, without statutory warrant, to continue the patent monopoly in this particular character of film after it has expired, and because to enforce it would be to create a monopoly in the manufacture and use of moving pictures films, wholly outside of the patent in suit and of the patent law as we have interpreted it."

Claim 1 of the patent there in suit, which is quoted in Petitioner's brief at page 24, was not involved in the *Motion Picture Patents* case. The claim there under examination was claim 7 (see 243 U. S. 505). Criticism of the Court of Appeals' decision on the basis of a claim not involved in the *Motion Picture* case is decidedly beside the point. Even if the claim on a motion picture machine had mentioned the film as an element, it is obvious that such mention did not make the film properly a part of the machine combination.

Both the Morgan Envelope and Motion Picture cases fall into the class in which the alleged primary infringer had derived *from the patentee himself* the right to use certain patented apparatus—a tissue-paper holder in the one case, and a motion picture projector in the other. This Court held that the legitimate possessor of the apparatus might obtain from any desired source the merely *passive* and *inert* objects upon which the patented apparatus was intended to operate—the tissue paper in the one case; the motion picture film in the other.

The decisions turned largely upon the right in the legitimate possessor of the apparatus to act in accordance with the implied *intention or license of the patentee.* The patentee, having authorized the possession and use of the apparatus, was presumed to have intended that the user be free to procure at will the transitory supplies of the inert paper or film. Obviously, since the user was held to be acting in accordance with the implied intention or license of the patentee, there could be no primary infringement; and no participation in the non-infringing use could be deemed contributory infringement.

These circumstances alone exclude petitioner's case from the reasoning of the *Morgan Envelope, Motion Picture* and similar cases. The primary infringer, Marchiony, constructed the patented combination (using Petitioner's refrigerant) without the slightest authority from Respondents, expressed or implied. None of the elements so used by Marchiony in making the combination, originated with Respondents or otherwise carried its license.

Respondents had sometimes sold solid carbon dioxide to Marchiony and, as an incident to such sale, had permitted Marchiony to use the particular solid carbon dioxide in making the patented combination. In other words, with each delivery of solid carbon dioxide, Respondents gave Marchiony a license to use it under the patent in suit. The only compensation for that license was the purchase-price paid for its solid carbon dioxide. In each instance the license terminated with the consumption of the particular solid carbon dioxide; the purchase-price compensated Respondents for that specific use alone. Obviously, Marchiony acquired no continuing right to make a multitude of embodiments of the patented combination, using therein essential operating elements (expressly claimed in the patent) which carried no license from and no compensation to Respondents.

Petitioner's brief (p. 23) mistakenly refers to "Marchiony's use of Petitioner's refrigerant in the 'licensed' cartons". This has an extravagantly erroneous implication. There was no such thing as a "licensed" carton. The only license ever given by Respondents was a limited right *appendant to each sale* of Respondents' own solid carbon dioxide. There was no medium through which a license might move from Respondents to Marchiony, excepting by, and to the limited extent of, Marchiony's purchases of Respondents' solid carbon dioxide.

Petitioner, at page 26 of its brief, has apparently admitted Respondents' whole case on contributory infringement, in saying that:

> "As pointed out by this Court in the *Morgan Envelope* and *Leeds & Catlin* v. *Victor* cases (*supra*) a contributory infringer must supply a necessary part to a completed patented combination with the knowledge that the ultimate infringement will, or is apt to occur."

Here the Petitioner did supply the necessary solid carbon dioxide of the completed patented combination, with the knowledge of the ultimate infringement, since it knew (*supra*, pp. 23, 26-28), just how Marchiony intended to use

that solid carbon dioxide, and, in addition, had been notified of infringement (p. 198).

The Petitioner continues:

> "Thus, one can contribute to the infringement of a patent for a machine by supplying a part of that machine. One may likewise contribute to the infringement of a patent for an art by performing a step in the process. Similarly, one may contribute to the infringement of a patent for an article of manufacture by contributing a part or ingredient of the manufactured article. *Logically, therefore, one could contribute to the infringement of a valid patent for 'a transportation package' if one supplied part of the materials employed in the fabrication of the package.*"

Thus, Petitioner admits that if solid carbon dioxide is a legitimate element of the patented combination package, furnishing that element is contributory infringement. We have shown (*supra*, pp. 6-12), that solid carbon dioxide is a legitimate element of the patented combination, and hence contributory infringement is proved by the Petitioner's own admission.

But the Petitioner's brief continues, on page 26:

> "But no contributory infringement would occur by merely supplying the goods to be transported by the package.
>
> "In the case at bar, solid carbon dioxide forms no part of the *structure* of the transportation package; it merely comprises the refrigerant that is used in the package."

Here the Petitioner is giving to the word "package" a meaning analogous to that of a box, or container, of any kind—a meaning not warranted by, but opposed to, the plain teachings of the patent. The transportation "package" of the patent is what a "package" usually is, namely, a covering material together with the contents. Claim 3 is for a transportation "package" which is there defined as "*consisting of*" a vented protective casing, frozen carbon dioxide and freezable products in a specified relation to the solid carbon dioxide. The solid carbon dioxide *is* a part of that package.

The Petitioners' brief proceeds (p. 26):

> "It [the solid carbon dioxide] stands in exactly the same category as the food stuffs to be shipped in the package. [Here, again, is the same misuse of the word package; the food stuffs are a part of the package.] If the specific refrigerant can be considered to be a part of the package *structure*, then, by pure logic, so can the ice cream that is refrigerated by the specific refrigerant. Pursued to its logical conclusion, the grocer who sold the sugar and other ingredients going into the ice cream, as well as the cow that supplied the milk, would all be contributors to the infringement. There is no distinction between the refrigerant and the material to be refrigerated in the claims of the patent. If one is an element the other, of necessity, must be."

It is all a question of intent—which we assume can never be attributed to the cow, and probably never to the grocer. Only when the grocer intentionally aided or conspired with the direct infringers would he be guilty of contributory infringement. The proof which the patentee would have to produce to support such a charge would be very difficult; it would probably be impossible to obtain with relation to such ordinary articles of merchandise as sugar and, the ingredients of the ice cream, all of which have myriad uses entirely unconnected with the patent in suit. The situation with reference to the solid carbon dioxide is, however, very different. It was not an article of commerce prior to the invention in suit; not a pound of it had been sold in the almost a century that it had been known. The invention in suit *made* it an article of commerce and, so far as appears, its present commercial usefulness is dependent upon its being used in the way first disclosed by the patent in suit.

4. The Petitioner, at page 25 of its brief, asserts that the construction given by the lower Court to the patent in suit is, in effect, stamping with legality under the patent laws that which is illegal under the Clayton Act; and argues that this emphasizes the error of that Court. This argument is based on the assertion that "the obvious purpose of the condition of sale imposed by Respondents, as expressed in its

invoices, was to tend to create a monopoly in the sale of solid carbon dioxide".

That is not at all the situation.

The purchasers of the solid CO_2 from the Respondents have been, from the beginning of the Respondents' sales in May, 1925, *licensed to assemble and use* the patented combination to the extent that they employ frozen carbon dioxide *purchased from the Respondents.* The following notice has appeared on all of Respondents' invoices since they began commercial sales in May, 1925 (following p. 196):

> "The merchandise herein described is shipped upon the following condition: That DRY-ICE shall not be used except in DRY-ICE Cabinets or other containers or apparatus provided or approved by the DryIce Corporation of America; and that DRY-ICE Cabinets or other containers or apparatus provided or approved by the DryIce Corporation of America shall be refrigerated or used only with DRY-ICE. These uses of DRY-ICE are fully covered by our Basic Method and Apparatus Patent No. 1,511,306. Granted October 14, 1924, and other Patents Pending."

This contains nothing which tends "to create a monopoly in the sale of carbon dioxide".

There is nothing in the notice to restrain the purchaser from buying shipping cases or cartons wherever he chooses; nor from buying solid carbon dioxide wherever he chooses; nor from using either of them. But if he chooses to purchase solid carbon dioxide from others, he gets no license; and if he uses it to make up the patented combination, he becomes an infringer.

Thus, in so far as the notice relates to sale of commodities, it does not express or imply any condition that the purchaser will not use or deal in those bought from a competitor.

Nor is the effect of the lower Court's decision contrary to the Clayton Act. That decision gives to the Respondents no monopoly in carbon dioxide, but only a monopoly in the patented package in which it is used in a specified way and to

which use the Petitioner contributes. The correct viewpoint is indicated by the admission in Petitioner's brief, quoted *ante* page 43:

> "Logically, therefore, one could contribute to the infringement of a valid patent for 'a transportation package' if one supplied part of the materials employed in the fabrication of the package."

5. The Petitioner argues, at pages 27 to 34 of its brief, that "the Slate patent is invalid as being for subject matter unpatentable under Section 4886 R. S."—this being on the theory that it is not an "art", nor a "machine", nor a "composition of matter", nor a "manufacture".

The Constitution provides, in Article 8, that "the Congress shall have power * * * to promote the progress of science and the useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries".

Acting upon this authority, the Congress has, in Section 4886 R. S. provided that

> "Any person who has invented or discovered any *new or useful* art, machine, *manufacture* or composition of matter"

may obtain a patent therefor. The words "art, machine, manufacture or composition of matter" were evidently intended to be all-inclusive.

There can be no question but that the patentees of the patent in suit have invented or discovered something which is highly new and useful.

They have embodied their discovery in a transportation package made up in a certain specified manner. It is a thing which is made by hand. It is manufactured. It is a manufacture.

The Court of Appeals held, in the present case (pp. 445-447):

> "The patent, if sustainable, must fall within the statutory phrase 'machine, manufacture or composition of matter'. Rev. Stat., Sec. 4886. The defendant denies that it is either.

"'Manufacture' seems the most apposite. The courts have given it a comprehensive definition. In *Johnson* v. *Johnston*, 60 F. 618, 620 (C. C. W. D. Pa.), Acheson, *J.*, said:

"'The term "manufacture", as used in the patent law, has a very comprehensive sense, embracing whatever is made by the art or industry of man, not being a machine, a composition of matter, or a design.'

"This has frequently been cited with approval, and many courts have sustained patents for constructions which are not ordinarily thought of as a 'manufacture.' See *Riter-Conley Mfg. Co.* v. *Aiken*, 203 F. 699, 703 (C. C. A. 3); *Cincinnati Traction Co.* v. *Pope*, 210 F. 443, 446 (C. C. A. 6); *International Mausoleum Co.* v. *Sievert*, 213 F. 225, 228 (C. C. A. 6); *In re Hadden*, 20 F. (2d) 275 (App. D. C.); *American Fruit Growers* v. *Brogdex Co.*, 35 F. (2d) 106 (C. C. A. 3). In the case last cited the court sustained a product claim consisting of a combination of fresh citrus fruit and a small quantity of borax carried by the rind in an amount sufficient to render the fruit resistant to blue mold decay. Of this the court said (p. 108):

"'The complete article is not found in nature and is thus an article of manufacture.'"

* * * * * *

"Here we have something, the food stuffs, which it is the object of the package to refrigerate and deliver, and which at the same time is one of the elements making up the package, the article of manufacture. But we see no reason why a substance may not play this dual role without invalidating the patented combination. Paraphrasing the language of Mr. Justice McKenna in *Leeds & Catlin Co.* v. *Victor Talking Machine Co.*, 213 U. S. 325, 335, we may say that if the operative relation of the food stuffs to the package were merely that of the log to the saw in the mill, wheat to the rollers which grind it, or pins to the machine which produces them; in other words, in no more operative relation than a machine and its product, are, the invalidity of the combination would be scarcely questionable. But here the food stuffs are really a constituent element of the combination package; their arrangement causes

them to help insulate the refrigerant from outside heat, thereby retarding its evaporation. They themselves operate upon another element of the combination and are not merely a subject operated upon by the article of manufacture. Nor do we see any reason for refusing to say that the package is a 'manufacture' because it is intended to have only a temporary life. While it lasts, surely it is a combination of physical elements never put together before, and exceedingly useful. True, it perishes in use; when the solid carbon dioxide has evaporated, the combination no longer exists. But it is not fatal to a patent that the patented device is to be destroyed by its use. Instance the case of a patented torpedo, referred to by way of illustration by Mr. Justice Brown in *Morgan Envelope Co.* v. *Albany Co.*, 152 U. S. 425, 434. We think that the 'transportation package' may be the subject of a valid patent."

Petitioner does not deny that the transportation package of the patent in suit is solely the result of a manufacturing operation in the course of which the food-stuff and solid carbon dioxide are packed in a shipping case or carton in such manner that the food-stuffs insulate the carbon dioxide, and the solid carbon dioxide refrigerates the food-stuffs directly and, by continuously evolving a low temperature gas, displaces the air in the package and thus acts as a refrigerant of those portions of the food-stuffs remote from the solid carbon dioxide. Admittedly, the Petitioner, by selling solid carbon dioxide to Respondents' customers, knowing that it was to be used in the transportation packages defined in the patent in suit, contributed toward the manufacturing operation involved.

What constitutes an article of manufacture within the meaning and purpose of the patent statutes presents no new question of law for determination, as is instanced by the decisions cited in the decision of the lower court from which we have quoted.

The Petitioner cites at pages 29-31 of its brief the *Corpus Juris* in support of its contention that Respondents' transpor-

tation package is not a manufacture. Surely the opening sentence of that quotation—

> "As used in the statute *the term 'manufacture' embraces whatever is made by the art or industry of man*, not being a machine, a composition of matter, or a design"—

is proof that the Slate patented arrangement is a manufacture.

The Petitioner accepts the Court of Appeals' statement (R. p. 445)

> "That this discovery would be patentable as a process we cannot seriously doubt"

and argues that this negatives the possibility of the alleged invention being patentable as a "manufacture", citing again the statement from the *Corpus Juris*, "A manufacture is distinct from the method or device by which it is produced." What the Court of Appeals was referring to as being "patentable as a process" was *not* the process of assembly of the transportation package, but, rather, the process by which, after the package was assembled and became a manufacture, the solid carbon dioxide served to fill the enclosing container with the very cold gas and drive out the air, while, at the same time, the food-stuffs protect the refrigerant against too rapid sublimation, whereby an extremely high and unexpected efficiency was obtained. The manufacture, the package having its constituent parts arranged as specified, was a means for carrying out the process of refrigeration. Even if a process patent might have been obtained, that surely does not mean that the package, a thing distinct from the process carried out by it, cannot be patented if new and useful, as it is.

The Petitioner at pages 33-34 also relies on a number of tariff taxation cases, in which the term "manufacture" is used in a narrow sense rather than in the comprehensive sense of the patent law, as the Courts in such cases normally construe the term "manufacture" rigidly. But in *Tidewater Oil Co.* v. *United States*, 171 U. S. 210, 216, the Court laid

down a definition of "manufacture" in the same sense as it was used in the patent law, namely, being "an article upon the material of which labor has been expended to make the finished product."

And that is the only sense in which the patent sustained by this Court in *Seabury* v. *Am Ende*, 152 U. S. 561, 567, was an article of manufacture and patentable. The patent was for a surgical dressing formed of cotton fibre saturated with boracic acid and glycerine. It was a "manufacture" as is the package of the patent in suit. This Court found it to be patentable for much the same reason that the package of the case at bar is patentable, saying:

> "The next contention is, that as the plaintiffs' patented dressing was composed of materials whose specific virtues and modes of operation were well known, there was no invention shown in combining them in the manner described. It is, indeed, true that the patentee did not claim to have been the first to suggest the use of cotton fibre as a means of excluding germs from wounds or from the article to be protected. Nor did he claim to have first discovered the antiseptic qualities of boracic acid or the hygroscopic property of glycerine. But the patentee was the first to perceive that by combining these articles, in the manner he pointed out, there would be formed a convenient and permanent dressing with the desirable qualities of the several constituents."

d. Petitioner insists, at pages 35-37 of its brief, that the patent in suit is for an aggregation of uncorrelated elements and therefore unpatentable—this on the assertion that there is no patentable combination between the specific refrigerant, solid carbon dioxide, and the material to be refrigerated, or the container in which it is packed. In this Petitioner is in error.

The invention resides in, and the claims specify, solid carbon dioxide and the products to be refrigerated arranged *in a specified relation to each other*, the relation being such that the products serve to shield the solid carbon dioxide from outside heat and are, in part, refrigerated directly by

the solid carbon dioxide, and, in part, by the constantly evolved cold gases which drive out air and moisture and insulate the products and the solid from external heat (pp. 6-8, *supra*).

The cooperative *arrangement* of the parts is what determines the functions of the combination as a whole, just as in the case of a machine made up of elements which must be arranged in a specified manner in order to combine to produce the result.

It is this arrangement, this co-relationship, which enables the refrigeration to proceed in a new manner and in accordance with principles not theretofore known. It is that co-relationship that results in a refrigerating *efficiency* of some twenty times that of water ice, whereas the best that had been done before was two times. The solid carbon dioxide *here* does not perform its functions in its "old, inherent or to be expected way"—but quite the contrary (see pp. 12-19, *supra*). While it was known that solid carbon dioxide evolved gas, no one knew how to make effective use of that fact. The arrangement of the patent in suit does that *because* of the co-relationship of the parts and the effect that each part has on the others in that relationship.

The Petitioner's brief states (p. 36) that "*any* refrigerant surrounded by *any* material to be refrigerated, both of which are located in *any* container, will function in the same way to produce the same results". That is entirely wrong.

Suppose water ice is used in place of the solid carbon dioxide. While the articles to be refrigerated, immediately surrounding the water ice, may become chilled, there is no "cold air inherently radiated from" it, as Petitioner asserts. Where is the air to come from? If it comes from outside of the package, it will, in entering and coming to the ice, heat, not chill, the material which should be refrigerated. If the air is contained in the package and merely circulates there, descending from the ice and taking up heat from the materials below, the air then becomes warm and rises to *heat*, not refrigerate, the materials higher up. And there would be no new, unexpected and highly beneficial results such as are

obtained from the use of solid carbon dioxide in this particular manner, results which are obtained because of the use of a refrigerant which continuously gives off large volumes of very cold gas which create a pressure and permeate all of the materials to be refrigerated, whether above or below the refrigerant, and pass out through the "vented" casing (see claim 3, pp. 20-21, *supra*), thus preventing air from entering the package and drivng out any air that may be there.

There is a true and new co-relation and cooperation between the elements when the solid carbon dioxide is used.

7. At pages 37-41 of its brief, the Petitioner argues that the patent in suit is invalid because anticipated or lacking in invention—this upon the basis of five prior patents.

If the Petitioner has contributed to the manufacture of a "Chinese copy" of the patent in suit, as it has, then it should, for justification, produce a prior art structure equally as good, that is, a "Chinese" anticipation. This it has not done.

The *Mosler & Ladewig* patent of 1881 (p. 399) for a "Refrigerating Butter Box" shows a form of refrigerator adapted to the use of water ice, and is like all *such* refrigerators in that the ice (in compartment D) is above the articles to be refrigerated so that the air chilled by the ice may pass down over the things to be refrigerated and then rise to be chilled again, and so on—the convection currents usual in water-ice refrigerators. The point of the Mosler & Ladewig patent was to use skeleton drawers for supporting the butter so that the chilled air might circulate readily through them. If solid carbon dioxide were substituted, in this construction, for the water-ice, it would exhibit only its usual refrigerating efficiency of twice that of water-ice (p. 82), not the high refrigerating efficiency of Slate's invention. This Mosler & Ladewig patent existed for more than thirty years before Slate's invention, and manifestly had in it no teaching of how carbon dioxide should be used.

The *Drummond* patent 533,794 of 1895 (p. 401) is for a shipping box in which the articles to be shipped are in the central chamber 7, and the water ice in the surrounding

chamber, 8 (p. 1, lines 67-69). A package, so made up, using solid carbon dioxide in place of water ice, would not only have none of the features of arrangement of the invention of the Slate patent but, also, would have none of its advantages.

The *Rumpel* patent of 1915 (p. 194) is for a lunch box, and the entire patent is directed to means whereby, upon the melting of the water-ice used to refrigerate the box, the water will be kept away from the lunch. The art of properly using solid carbon dioxide as a refrigerant could not, and did not, learn anything from this patent.

Josephson patent 1,515,119 (p. 210) shows a device for attempting to utilize carbon dioxide or similar gas supplied from the usual carbon dioxide cylinder. As the valve is on top of the cylinder, it is obvious that when the valve is opened no liquid would emerge from it and no snow would be formed, as is admitted by Churchill (p. 58). Further, the specification contains no disclosure about the formation of snow or solid carbon dioxide. So, obviously, the patent is not in point.

The *Elworthy* patents have been discussed at pages 4-5, *supra*.

8. The Petitioner urges, at pages 41-44 of its brief, that the patent in suit is void for insufficiency of disclosure—this upon the testimony of Jones there referred to.

But Jones is not there stating the things found to be necessary to produce a "practical" structure, as Petitioner asserts; he is stating the things to have in mind and provide for in order to utilize the invention to its highest efficiency (pp. 150-151). As Jones said (p. 154, fol. 220), "a knowledge of those factors would be sufficient to design an efficient package, but an efficient package could be constructed without a knowledge of any of them."

9. Finally, the Petitioner urges, at pages 44-48 of its brief, that the patent in suit is invalid because of prior knowledge and use by four persons.

The *Churchill* alleged prior use, illustrated in drawings (following p. 326) which, however, was made for the purposes of this suit (p. 82), was merely an isolated use of experimental apparatus in 1915; he has never used it since that time (pp. 75-76). The arrangement, moreover, has nothing whatever to do with the issues in this case. As shown in the drawings referred to, the solid carbon dioxide was used just as water ice had been used; the product to be refrigerated was surrounded by the carbon dioxide, just as, in the Drummond patent mentioned above, the product was surrounded by water ice. Churchill used solid carbon dioxide in lecturing in elementary chemistry; he froze mercury and eggs, and froze water in a red hot crucible. And, abroad, Churchill used it to produce low temperatures in vessels in which he was carrying on certain organic reactions, and to accelerate the crystallization of certain liquids (p. 4, *supra*).

He did not do what is disclosed in the patent in suit; and the work which he did do had no effect whatever in advancing the use of solid carbon dioxide.

The first of *Starr's* alleged prior uses was twenty-four years ago, and consisted in placing solid CO_2 and human tissues in an insulated box "in the usual way that refrigerants are used to produce a very low temperature in the small box refrigerator" (p. 46). The usual way is *not* to surround the refrigerant with the product, but the reverse.

His second use, nineteen years ago, was in an ordinary household refrigerator—"we made a test of this Dry-Ice and water ice by using two refrigerators of exactly the same construction side by side and using water ice in one and the so-called Dry-Ice in the other" (p. 51). Also, "there was no question as to either one or the other producing refrigeration in the same way and for the same reasons" (p. 52).

And his conclusion was that a pound of solid carbon dioxide would do the work of approximately two pounds of water ice (p. 87) and, as he then proceeds to say (p. 52):

> "I was able to make a comparison of the cost of doing a certain amount of refrigeration one way and doing it the other way. For ordinary refrigerating purposes the

cost of dry ice seemed so very much in excess of the cost of doing the same work with water ice that it led to the conclusion that for that purpose water ice would be the more expedient and the better thing to use. The most practical thing to use commercially."

Thus Starr, like others, attempted to use solid carbon dioxide just as water-ice had been and is used. When used in that manner, the advantage gained is so small that the cost is prohibitive. There was no market for it. Starr, testifying about his experiments in 1910, was asked and said (p. 86):

"Q. At that time there was no market for solid carbon dioxide, was there?

A. Oh, no. It was not sold. We were trying to find out whether there would be a market for it."

And he—a man of whom Petitioner's brief states (p. 46) that he is perhaps the leading authority in the United States on commercial refrigeration—failed in his attempt to do anything which would make a market for solid carbon dioxide.

The *Lavigne* alleged prior use was a stock promotion scheme initiated in 1923, which resulted in failure. The story is that a cylinder, holding liquid carbon dioxide under pressure, was attached to a box into which led a pipe from the cylinder; when a valve at the cylinder was opened the gas, under pressure, entered the box and there expanded and produced a cold gas or, perhaps, solid carbon dioxide and thus chilled the interior of the box and froze water there (p. 100). It is said that a unit was made up, intended to go in a refrigerator, but it is not pretended that a satisfactory unit was obtained until well along in 1924 (pp. 113, 131, 181-185) and the patent in suit was filed in January of that year. In any event, the thing was entirely unsuccessful (pp. 114, 184). It is asserted that some containers were made for shipping ice cream, but that, also, was after the invention in suit (p. 104).

Not only was the whole of this stock promotion scheme a failure, but nothing definite was done until after Slate's

filing date of January 10, 1924, and as the supposed Lavig use was not set up as an instance of prior invention it c not be considered here. Further, its inception was after t Liquid Carbonic Company had begun to supply liquid ca bon dioxide to the Respondents' predecessor, The Prest-A Corporation, for the manufacture of solid carbon dioxi (pp. 137-138) for the commercial development of the Sla invention.

The *Goosmann* prior use consisted in proposing for u and using solid carbon dioxide for external applicatio in lesions and skin diseases, and for freezing small spec mens for miscroscopic slides (p. 118). Goosmann admit that, in spite of his extensive writings, the only use that h has mentioned prior to (the Slate invention) is for medic purposes (pp. 122-3).

In spite of all the knowledge which existed as to carbo dioxide, it does not appear that any of the solid was eve sold or entered into commercial channels in any way.

The prior art presented by Petitioner contributed ab solutely nothing to the practical art of refrigeration. Th prior patents and publications of record were mere pape suggestions of no practical value. There is not a word o evidence that any prior art suggestion was ever practiced i commercial refrigeration, or that solid carbon dioxide wa ever manufactured industrially for any refrigerating pur poses.

Conclusion.

Respondents' case may be summarized thus:

1. Slate was the very first to teach *how to use* solid CO_2 as a practical refrigerant.

2. Slate *rejected* the prior suggestions that solid CO_2 could be merely substituted for water-ice in the customary combinations and relationships; and conceived, with true vision, that refrigerating methods, and the *relations of the*

elements involved, must be radically changed in order to obtain from solid CO_2 a high refrigerating efficiency commensurate with its relatively great cost.

3. Slate invented such a combination and coordination of elements that the solid CO_2 was rendered from *fifteen to twenty or twenty-four times more efficient* than water-ice—as contrasted with the universal belief in the prior art that it could not be made more than *twice* as efficient as water-ice.

4. By teaching *how to use* solid CO_2 with astonishingly high efficiency, Slate created the first demand that ever existed for commercial production of solid CO_2; a demand (emerging directly from Slate's accomplishment) which was the sole inducement to this Petitioner to undertake its infringement.

5. In three years Respondents have sold nearly 5,000,000 pounds of solid CO_2, about 90% of which has been used as the essential element of the combination of the patent in suit—this sharply contrasting with the non-existence of *any* business in the sale of solid CO_2 prior to Slate.

6. The *mechanical combination* of elements invented by Slate was *novel per se*. The idea was radically new; that is, it was new to *interpose* the food to be refrigerated *between* the outer container and the solid CO_2, so that the latter should be *"less* accessible for exterior heat" (Claim 3 in suit; *supra*, p. 20) than the very food which is to be protected against that "exterior heat"—a concept utterly repugnant to the prior art teachings.

7. The use of this new mechanical combination produces generically *new results*. Four different elements of insulation are made to protect the solid CO_2, and greatly prolong its life and enhance its efficiency (*supra*, pp. 9-10). The solid CO_2 and its sublimated cold gas are caused to provide a refrigerant; a self-insulating medium; a heat purge not only

forcing out warm air but flowing out and carrying off heat units; and an automatic control of refrigerating effect responsive to temperature changes (*supra*, pp. 11-12).

8. Slate's invention is conspicuously inventive. If it had involved only obvious adaptation of old elements, the prior art could not have persisted for nearly a century in supposing that solid CO_2 can never have more than twice the efficiency of water-ice. The art would not have waited for Slate to teach how to use solid CO_2 with fifteen to twenty-four times water-ice efficiency. Petitioners' skilled experts would not have been so astonished when finally convinced of the high efficiencies obtainable by using Slate's invention (*supra*, p. 18 *et seq.*). Petitioner itself would not have lauded so highly the "new refrigerant", in its own advertising (*supra*, p. 17).

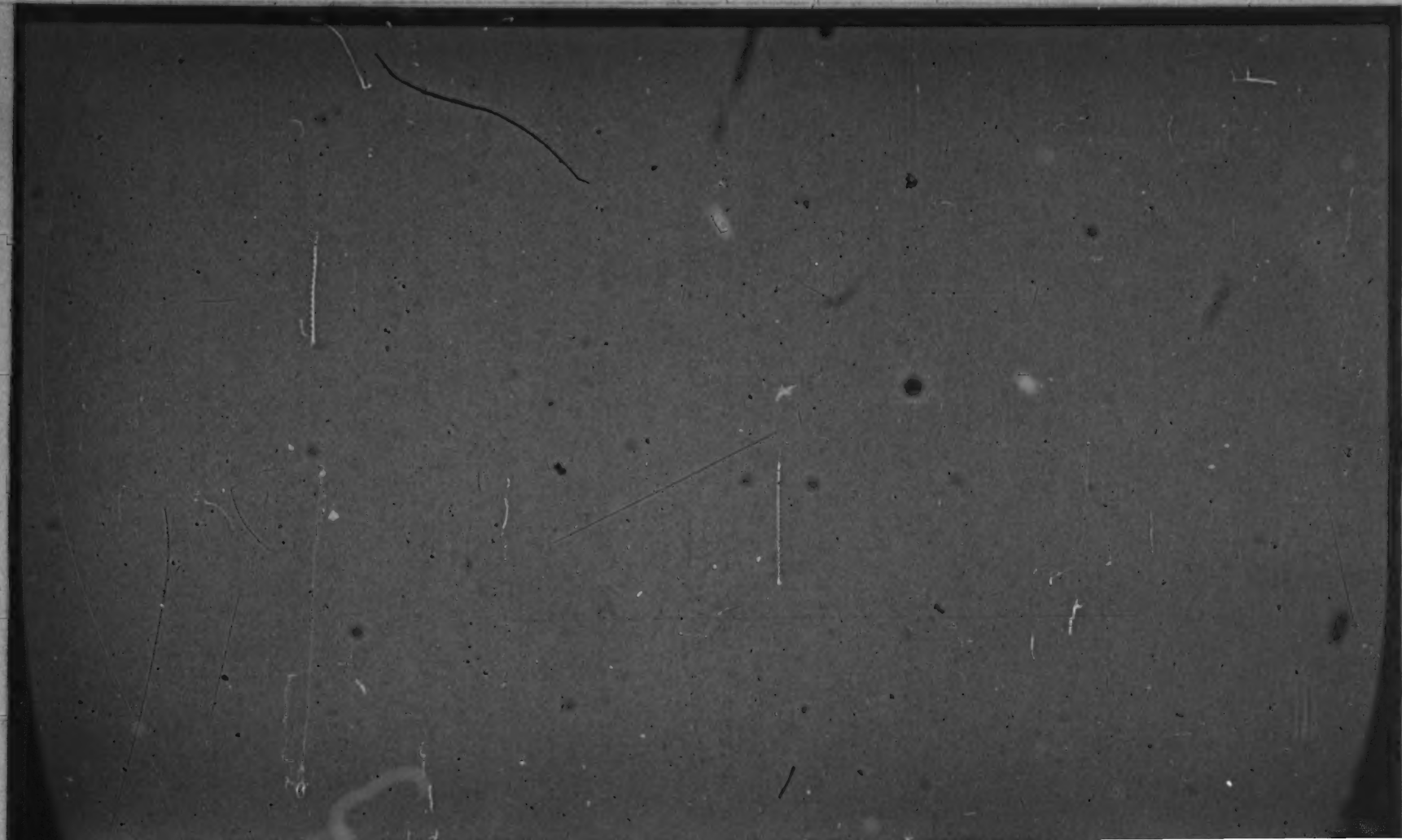
9. Petitioner infringes by furnishing the solid CO_2, which is the dominating element of the patented combination, knowing that it is to be used in that combination in which, alone, its efficiency as a refrigerant economically manifests itself.

We submit that the decision of the Court of Appeals should be affirmed.

Respectfully submitted,

CHARLES NEAVE,
GEORGE C. DEAN,
CLARENCE D. KERR,
Of Counsel for Respondents.

December, 1930.



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IN THE

Supreme Court of the United States

October Term, 1930.

No. 54.

CARBICE CORPORATION OF AMERICA,
Petitioner,

vs.

AMERICAN PATENTS DEVELOPMENT CORPORATION and DRY ICE CORPORATION OF AMERICA,
Respondent.

PETITION FOR RECONSIDERATION AND OTHER RELIEF.

SAMUEL E. DARBY, JR.,
Attorney for Petitioner.

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Respondent.

PETITION FOR RECONSIDERATION AND OTHER RELIEF.

To the Honorable, The Chief Justice and Associate Justices of the Supreme Court of the United States.

Your petitioner, Carbice Corporation of America, respectfully prays for a reconsideration of the above entitled case with respect to the following matter:

1. This cause, a patent infringement suit, was before this Court on writ of certiorari, granted April 21, 1930 (281 U. S. 711), directed to the Circuit Court of Appeals for the Second Circuit.

2. The suit was based on Slate patent No. 1,595,426, the claimed invention of which was the locational arrangement, in an unpatented container, of a specific unpatented

refrigerant (solid carbon dioxide) relative to food stuffs to be refrigerated (such as packages of ice cream).

3. The validity of the Slate patent was denied by petitioner on the following grounds, among others:

(a) Because the locational arrangement of an unpatented refrigerant, relative to unpatented materials to be refrigerated, in an unpatented container, did not constitute patentable subject matter.

(b) Because the claimed invention was not patentable under Section 4886 R. S.

(c) Because of anticipation.

4. The case was briefed, argued, and submitted to this Court, and on March 9th, 1931, this Court, speaking through Mr. Justice BRANDEIS, announced its decision reversing the judgment of the Court of Appeals for the Second Circuit.

5. Although the opinion of this Court expressly pointed out that the validity of the patent was one of the issues raised, this Court did not expressly pass on that question, but ruled, in effect, that the patent owner could not employ the patent to secure a limited monopoly in the unpatented refrigerant, solid carbon dioxide.

6. On or about the 10th of March, 1931, one day after the opinion of this Court was announced, the Dry Ice Corporation released to the public press a statement relative to the decision of this Court in this cause. This statement is reproduced in full in the appendix hereof (p. I). As appears from an inspection thereof, the statement was carefully worded to convey, and did convey to the public press, that the Slate patent in suit No. 1,595,426 was sustained by this Court as valid. As a result, there appeared in the morn-

ing edition of the New York American of March 11, 1931 (reproduced in full in the appendix hereof, p. III) the news item encaptioned in large type "Dry Ice Corp. Patent Monopoly Sustained". In the afternoon issue of the New York Evening Post of the same date (reproduced in full in the appendix hereof, p. IV) a similar news item appeared under the heading "Dry Ice Plans to Sue". Included in the news item is the statement *"The Supreme Court recently upheld the patents of the company in its suit against the Carbice Corporation"*. In the Wall Street Journal of Wednesday morning, March 11, 1931 (reproduced in the appendix hereof, p. V), appears an article to the same effect under the caption "Dry Ice to File New Patent Suit".

7. The statement of the Dry Ice Corporation released to the public press indicates the commencement of and an intention to continue a wide campaign of intimidation by patent infringement suit, under the Slate patent, and threat thereof, to users of solid carbon dioxide. Quite obviously such intimidating threats and infringement suits will be directed only to customers of petitioner and those who do not acquire their unpatented refrigerant from the Dry Ice Corporation.

8. Thus, due to the fact that the Court did not pass upon the validity of the patent, Respondent is put in a position, stated by it to be with the sanction and approval of this Court, whereby it can institute a mass of vexatious litigations, and wage a campaign of intimidation to accomplish indirectly what this Court has held it cannot directly accomplish, viz.: establish a limited monopoly in the manufacture and sale of the unpatented refrigerant, solid carbon dioxide, for use in connection with the transportation of food stuffs.

WHEREFORE YOUR PETITIONER PRAYS:

(a) For a reconsideration of the case to the extent that this Court rule on the validity of the patent.

(b) That the mandate of the Court include direction to the District Court to enter a decree of invalidity of Slate patent No. 1,595,426.

(c) For such other or additional relief as to the Court may seem just, or the circumstances warrant.

Inasmuch as the issue of validity of the Slate patent has been briefed by both Petitioner and Respondent, and was orally argued before the Court, an oral rehearing is not necessary or requested by this petition, unless the Court desires oral argument on the point.

Respectfully submitted,

SAMUEL E. DARBY, JR.,
Attorney for Petitioner.

Dated, New York, N. Y., March 14, 1931.

STATE OF NEW YORK, }
COUNTY OF NEW YORK, } ss.:

SAMUEL E. DARBY, Jr., being duly sworn, deposes and says:

That he is the attorney for petitioner herein; that he prepared the foregoing petition and that the allegations thereof are true as he verily believes; and the petition is presented in good faith and not for delay.

SAMUEL E. DARBY, JR.

Subscribed and sworn to before me this 14th day of March, 1931.

ROSE A. BATTERMAN,
Notary Public, New York County.
N. Y. Co. Clk's No. 64, Reg. No. 2B44.
Commission expires March 30, 1932.

[SEAL]

APPENDIX.

I.

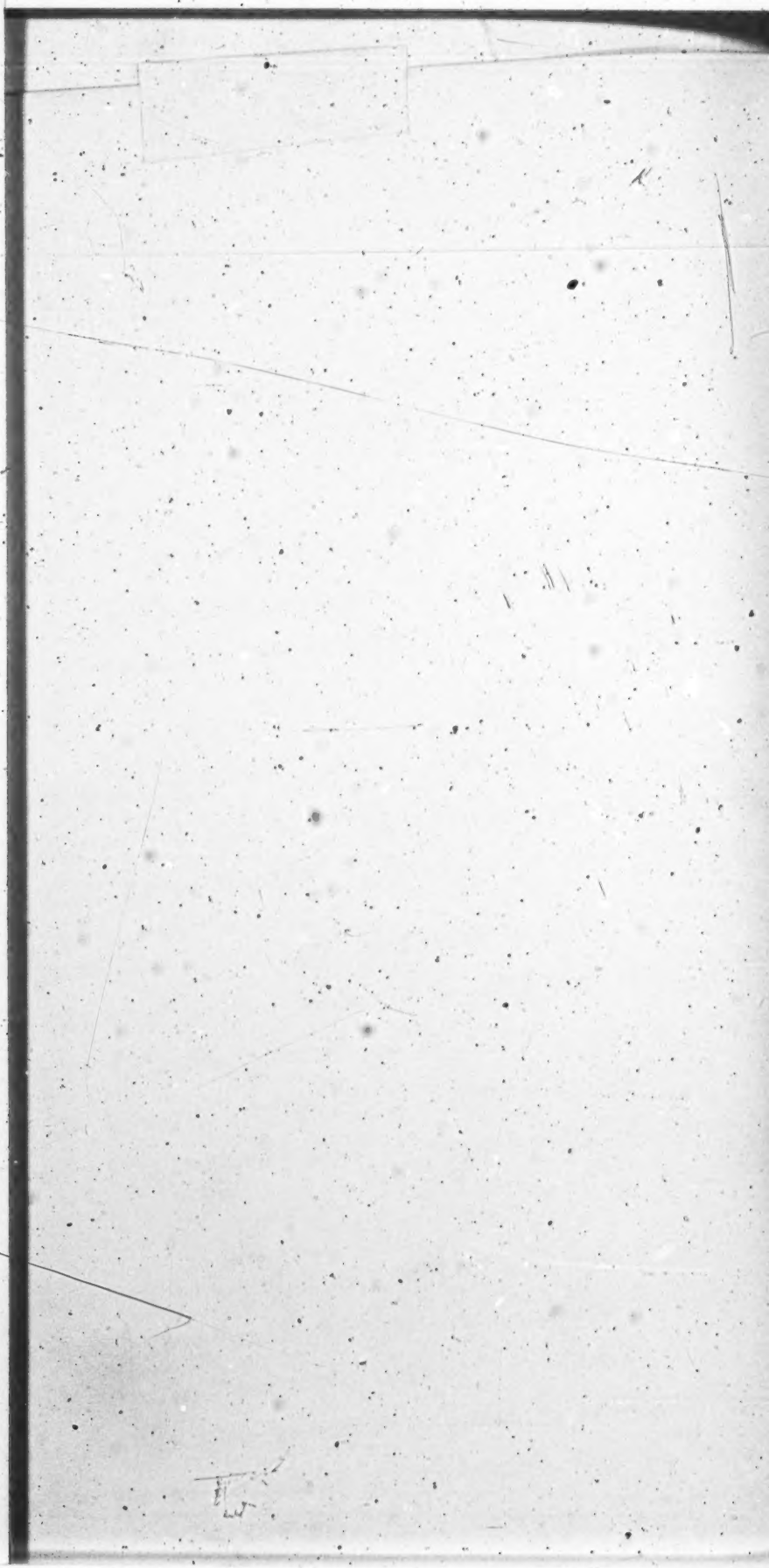
Immediate Release
DryIce Corporation of America
52 Vanderbilt Avenue,
New York, N Y.

On Monday, March 9, 1931, the Supreme Court handed down its decision in the suit brought by the DryIce Corporation, under one of its one hundred patents, against the Carbice Corporation.

In the same suit, the Federal Circuit Court of Appeals held the patent valid, and that holding of validity was not disturbed by the Supreme Court decision.

The Supreme Court said that the invention claimed is for a particular kind of a package employing solid carbon dioxide in a new combination and pointed out that if the patent is valid the owner can, of course, prohibit entirely the manufacture, sale or use of such packages or can graht licenses.

Since the validity of the patent, as sustained by the Court of Appeals, has not been disturbed, the DryIce Corporation is now forced to seek its remedies for infringement of this patent by suing directly against the user of solid carbon dioxide who makes the patented package without license. For this purpose a new suit is being filed today.



The DryIce Corporation had desired not to sue customers and had preferred to confine its infringement suits to those who sold solid carbon dioxide for infringing use. The Supreme Court, however, disapproved that procedure. In no way was the true patent monopoly limited or curtailed.

Since the validity of the patent remains undisturbed, the Supreme Court decision is decidedly beneficial to the DryIce Corporation because it designates the proper procedure for protecting the company's valuable patent rights.

The DryIce Corporation of America operates directly a chain of eighteen plants and twenty-seven sales outlets distributing its product to all parts of the United States. Its product, under the trade-mark "DRY-ICE", is used in the refrigeration of railroad cars, trucks, ships and independent packages for mail and express shipment. It is of large and growing importance in the refrigerated transportation of meat, fish, ice cream, milk, frozen foods and many other perishable products. During the year past approximately 30,000 tons of "DRY-ICE" were used in the United States. In its decision, cited above, the U.S.Circuit Court of Appeals pointed out that the DryIce Corporation had "created a new industry".

III.

New York American, March 11, 1931.

Dry Ice Corp. Patent Monopoly Sustained

J. D. Small, vice-president of Dry Ice Corporations, commenting upon the Supreme Court ruling relative to the procedure necessary to protect company's patent right, declared yesterday:

"Since the validity of the patent, as sustained by the Court of Appeals, has not been disturbed, the Dry Ice Corporations are now forced to seek their remedies for infringement of this patent by suing directly against the user of solid carbon dioxide who makes the patented package without license. For this purpose a new suit is being filed immediately.

"The Dry Ice Corporations had desired not to sue consumers, but had preferred to confine their infringement suits to those who sell solid carbon dioxide for infringing use. But as we interpret the decision, the Supreme Court disapproves that procedure and indicates that the proper way to enforce the patent monopoly is by directly suing those who use solid carbon dioxide in the patented combination without license. In no way was the true patent monopoly limited or curtailed."

IV.

New York Evening Post, March 11, 1931.

DRYICE PLANS TO SUE

Threatens to Take Legal Action for Patent Infringement

The Dryice Corporation of America, in a statement issued today, indicated it would take legal action for infringement of its patents against users of solid carbon dioxide making patented packages without a license.

The Supreme Court recently upheld the patents of the company in its suit against the Carbice Corporation.

"Since the validity of the patent, as sustained by the Court of Appeals, has not been disturbed," the company stated, "the Dryice corporations are now forced to seek their remedies for infringement of this patent by suing directly against the user of solid carbon dioxide who makes the patented package without license.

"The Dryice corporations had desired not to sue consumers, but had preferred to confine their infringement suits to those who sell solid carbon dioxide for infringing use. But, as we interpret the decision, the Supreme Court disapproves that procedure, and indicates that the proper way to enforce the patent monopoly is by directly suing those who use solid carbon dioxide in the patented combination without license."

Wall Street Journal, March 11, 1931.

DRY ICE TO FILE NEW PATENT SUIT

Official of the Company Says Action Will Be Taken Against the Consumer

J. D. Small, vice president of DryIce Corp. of America, issued the following statement:

"On Monday, March 9, 1931, the Supreme Court handed down its decision in the suit brought by the DryIce Corp., under one of its one hundred patents, against the Carbice Corp.

"In the same suit, the Federal Circuit Court of Appeals held the patent valid, and that holding of validity was not disturbed by the Supreme Court decision.

"The Supreme Court said that the invention claimed is for a particular kind of a package employing solid carbon dioxide in a new combination and pointed out that if the patent is valid the owner can, of course, prohibit entirely the manufacture, sale or use of such packages or can grant licenses.

"Since the validity of the patent, as sustained by the court of Appeals, has not been disturbed, the DryIce Corporations are now forced to seek their remedies for infringement of this patent by suing directly against the user of solid carbon dioxide who makes the patented package without license. For this purpose a new suit is being filed immediately.

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"Since the validity of the patent remains undisturbed, the Supreme Court decision is beneficial to the DryIce Corporations because it designates a proper procedure for protecting the company's valuable patent rights."